ECHNOLOGY DEPT.

MAY 1, 1957

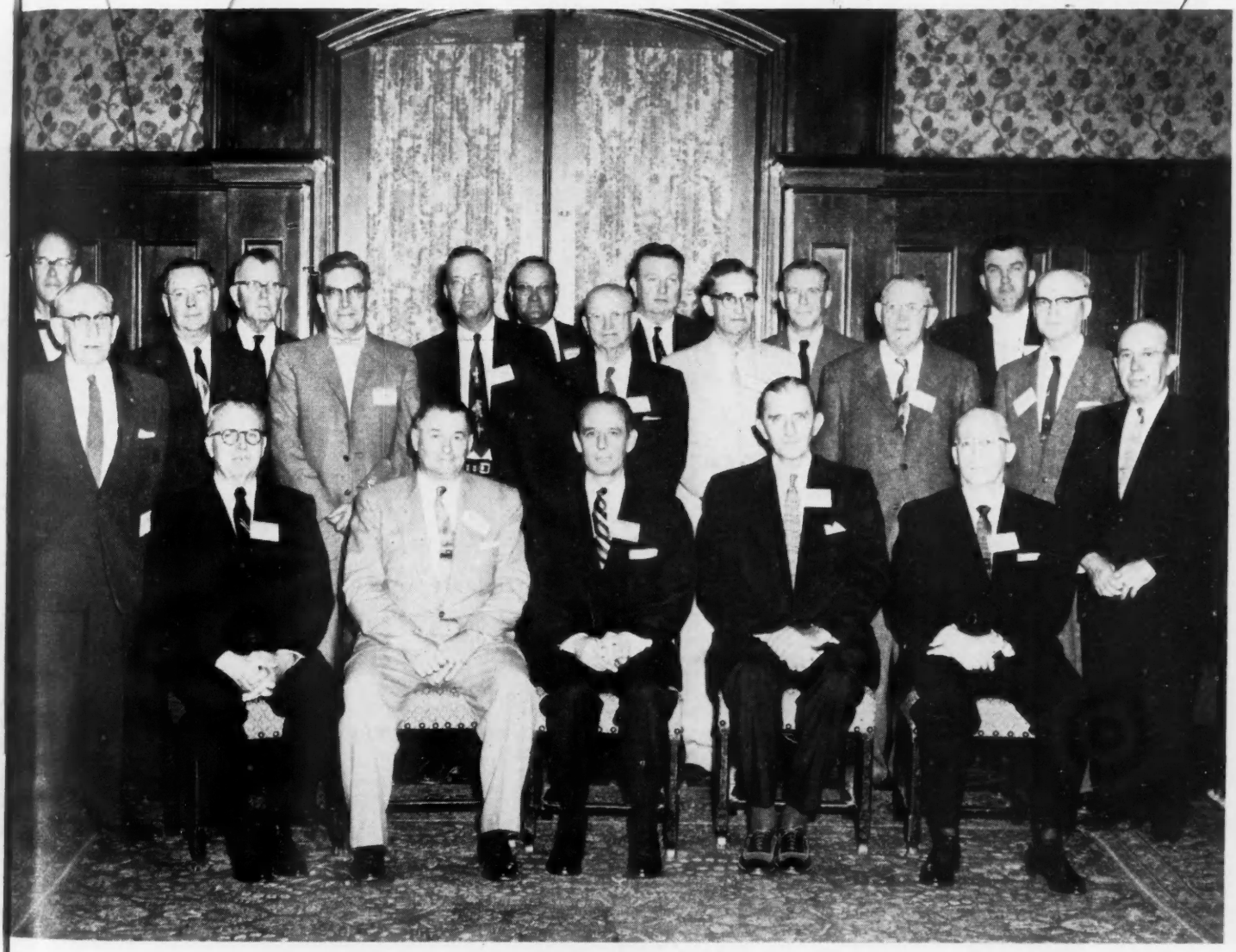
Telephone Engineer

AND MANAGEMENT

THE NATIONAL TELEPHONE MAGAZINE

PUBLIC LIBRARY
MAY 16 1957
DETROIT

U 67 - #9



FEATURING IN THIS ISSUE

- ★ **THE INDEPENDENT AND DIRECT DISTANCE DIALING,** *by L. A. Hodson*
- ★ **HOW ARE YOUR TELEPHONE MANNERS?** *by Phil Glanzer*
- ★ **DON'T BE A HERMIT—PARTICIPATE IN CIVIC AFFAIRS,** *by E. L. Fair*
- ★ **PLANNING PLANT PRACTICES,** *by T. DeWitt Talmage*

up a tree?

Increased costs edging you out on a limb? Maybe we can help. Records show that our Complete Directory Service Plan is operating successfully for independent telephone companies in 4400 communities. We handle everything. Turn out good looking directories . . . with fewer headaches, more income.

Like to know how? We'll be happy to show you. Just call or write our nearest office.

GENERAL SYSTEM

GENERAL TELEPHONE DIRECTORY COMPANY

1800 Busse Highway • DES PLAINES, ILLINOIS • VAnderbilt 4-2164

Divisional Sales Offices

COLUMBIA, Mo. • 811 Cherry Street • Gibson 2-6907
DURHAM, N.C. • 108 E. Parrish Street • Tel: 5133
ERIE, Penna. • G. Daniel Baldwin Building • Tel: 2-4187
FORT WAYNE 2, Ind. • 229 E. Berry Street • Eastbrook 3477
LEXINGTON, Kentucky • 157 Walnut Street • Tel: 4-7626
LONG BEACH 15, Calif. • 1775 Ximeno Ave. • HEmlock 3-7441
MADISON, Wisconsin • Tenney Building • ALpine 7-1667
SAN ANGELO, Texas • 110 South Taylor St. • Tel: 6738
SPOKANE, Wash. • 108 N. Washington St. • MAdison 4-4336
SPRINGFIELD, Ill. • Myers Bros. Building • Tel: 8-3425

Cable leaving ship's stern must withstand the rigors of installation and give long, efficient service. BAKELITE polyethylene plays a vital role in meeting these requirements.

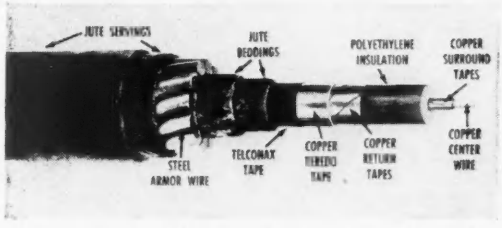
How BAKELITE Polyethylene serves . . .

On the bottom of the Atlantic Ocean

The electrical and physical properties combined in BAKELITE Brand Polyethylene Compound DFD-6505 make it especially useful for service in submarine cable. Its insulation values are excellent and its rate of moisture absorption extremely low. Physical properties, such as light weight, flexibility and resistance to cracking at low temperatures, further equip it for the rigorous installation and operational requirements imposed by the undersea environment.

These are some of the reasons why Bakelite Polyethylene DFD-6505 is being used for the inner insulation of the American segment of the North Atlantic telephone line and the Alaskan cable, reaching 1600 miles between the state of Washington and Alaska. Since 1950, over 4,000 miles of submarine cable have been insulated with DFD-6505.

BAKELITE Brand Polyethylene and Vinyl covered wire and cable meet the demands of the telephone and communication industries. To keep informed about the latest developments, you can receive regular copies of Kabelitems and other pertinent technical data. Simply send your request to Dept. XJ-183.



Cutaway photo shows complex structure of this cable.

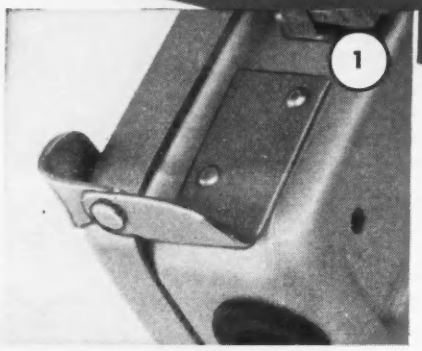
BAKELITE BRAND POLYETHYLENE

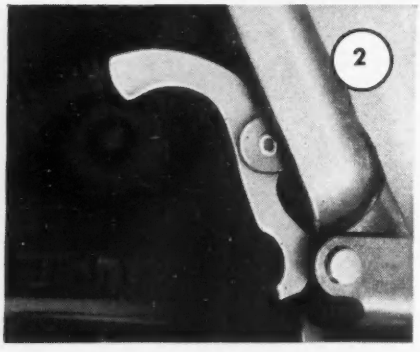
BAKELITE COMPANY, *Division of Union Carbide Corporation* UCC 30 East 42nd Street, New York 17, N. Y.

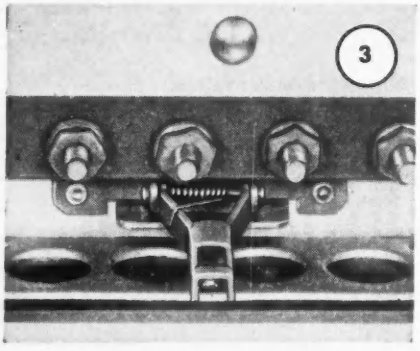
The term BAKELITE and the Trefoil Symbol are registered trade-marks of UCC.

Stranterm

FIRST SHOWING OF

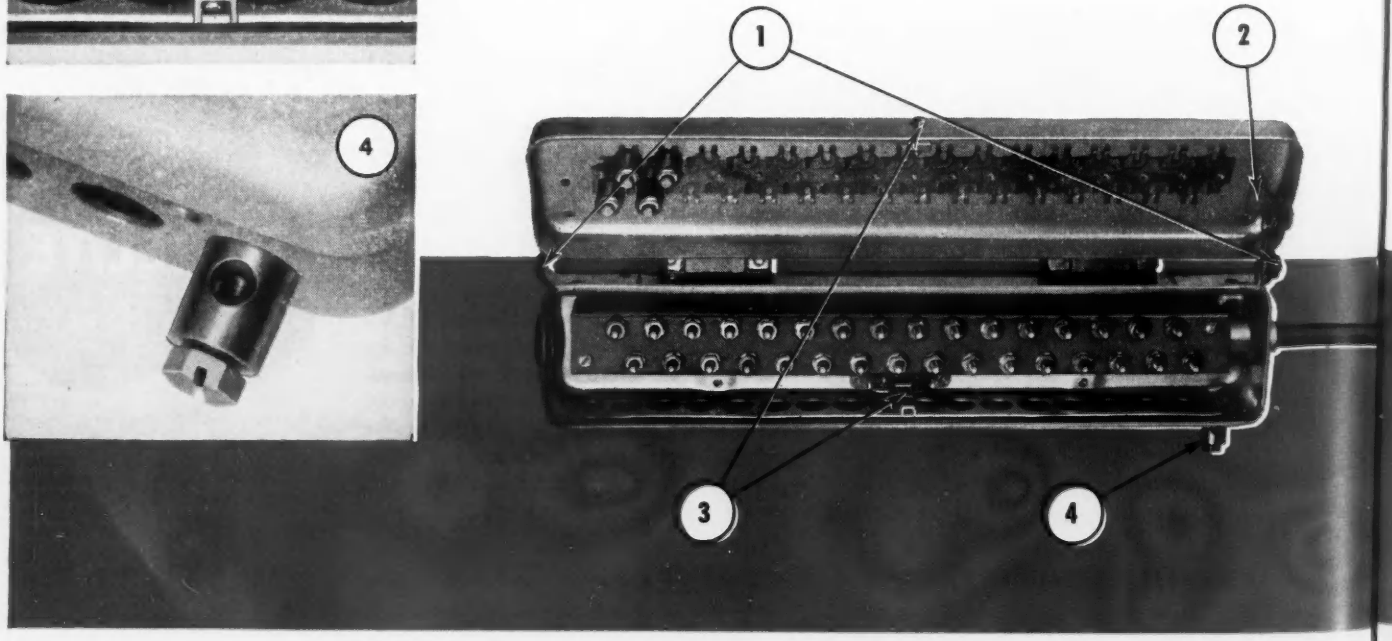






IMPORTANT IMPROVEMENTS WHICH THE 1957 MODELS WILL FEATURE

1. **WIDE ARC COVER HINGE:** Which makes interior of terminal more accessible for servicing. Hinges are of heavy stainless steel construction and reinforced.
2. **AUTOMATIC COVER STOP:** Which holds cover in fixed, open position while terminal is being serviced.
3. **PUSH BUTTON COVER LOCK:** Makes interior of the terminal readily accessible without use of tools and positively locks cover against impact or vibration.
4. **HEAVY DUTY GROUND STUD:** Conveniently located for outside wiring of No. 6 bare or insulated ground wire when applying protection.



THE 1957 MODEL WITH IMPROVEMENTS FOR THE FUTURE

Distributors will soon be showing the new 1957 Stranterms in three new body styles, and capacities ranging through 6, 11, 16 and 26 pair sizes.

The new Stranterms are provided with an alodized, aluminum alloy, drawn metal body. Door latching members and cover supports are interior positioned. The doors are arranged to lift and set in a raised position while the terminal is being serviced. When ready to close, the latch is released, and the door is "pushed home" where it is rigidly locked. Inland Testing Laboratories tests show this terminal to be weather-proof and rain tight when deluged with water. The terminal is light in weight, easy to install and very convenient for connecting or changing drops. It is furnished with either lead or plastic stubs. Stranterm also features an ingenious bell shaped cable nozzle which eliminates cable breakage due to excessive right angle bends.

The Stranterm is the only Strand Mounted Terminal which may be initially installed unprotected and can later be protected optionally, on a pair by pair basis by the easy insertion of snap-in Minigap or Mytigap Arresters as determined by the outside plant engineers' requirements. We suggest that you try a Stranterm today and investigate the economies and improvements now made possible in your outside plant construction.

IMAGINE! $162.25 PER MONTH*

at this out-of-the-way location

You'd be surprised at some of the unlikely locations that turn out to be profitable paystation sites. Take this intersection in Fort Wayne, Indiana. It's out of the main business district, and traffic is light. Yet the telephone company, after careful checking, saw good revenue potential here. So an AUTELCO paystation was installed. The result speaks for itself:

**Average gross revenue per month for the last six months was an amazing $162.25.*

Many locations in your area could prove as profitable as this Fort Wayne intersection. Our Survey Simplifier will help you determine the right locations. For your copy, write: *Automatic Electric Sales Corporation, 1033 W. Van Buren St., Chicago 7. Or call HAymarket 1-4300.*

Circular 1877 gives you detailed information on the new AUTELCO "80" series paystations. Write to the above address.

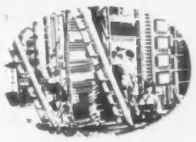
AUTOMATIC ELECTRIC

A MEMBER OF THE GENERAL TELEPHONE SYSTEM

ONE OF AMERICA'S GREAT COMMUNICATIONS SYSTEMS

Direct Distance Dialing 33

Here you will find the answers to many of your questions on Direct Distance Dialing as TE&M Author L. A. Hodson discusses the general toll switching plan and (1) automatic alternative routing, (2) limited transmission losses. This is Chapter VI in a series prepared exclusively for TE&M readers.



Your Telephone Manners? 39

Of course we hope they're good and we thought our's were good until Author Phil Glanzer showed us the fine points of using a telephone to win friends and proved that "when we speak we speak twice—our words say one thing and our voice another."

Planning Plant Practices 43

Author Ted Talmage is back with another article in his popular series and this time he points out "that the man who knows ***how*** will always have a job but the man who knows ***why*** will be his boss."

Participate In Civic Affairs 48

One executive told the author - "It's a waste of time—you can't build business by doing anything but sticking to the business . . ." Another said—"I consider participation in civic affairs an absolute must!"

Editorial & Business Staff

EDITOR, Ray W. Smith
ADVERTISING DIRECTOR, Roy F. Smith
MANAGING EDITOR, John G. Reynolds
TECHNICAL EDITOR, John S. Reed
ADVERTISING MANAGER, Donald C. Sorensen
PRODUCTION MANAGER, Helen McCorkle
ASSISTANT PRODUCTION MGR., Emily Budde
ADVERTISING ASSISTANT, Betsy Taylor
OFFICE MGR., Betty Schroeder
WASHINGTON BUREAU, Roland Davies & Fred Hencke
CIRCULATION MANAGER, Pat Lawhorn

Volume 61, No. 9. Published on the 1st and 15th of each month by TELEPHONE ENGINEER PUBLISHING CORP. Office of Publication, Rochelle, Ill. Executive and Editorial Office, 7720 Sheridan Road, Chicago 26, Ill. Telephone — Rogers Park 4-3040. Subscriptions: U. S. and Possessions, $3.00 per year; Canada $3.50; in all other countries, $5.50. Single copies, U.S.A., 50 cents. Entered as Second Class matter at the post office at Rochelle, Ill. under the act of March 3, 1879.

Copyright 1957 by Telephone Engineer Publishing Corp.

Telephone Engineer

AND MANAGEMENT

THE NATIONAL TELEPHONE MAGAZINE

Vol. 61 No. 9 MAY 1, 1957

ARTICLES

A Proclamation — "National Telephone Week ... 9
Editorial — "USITA Engineering Conference" ... 31
The Independent and Direct Distance Dialing ... L. A. Hodson 33
How Are Your Telephone Manners? ... Phil Glanzer 39
Planning Plant Practices ... T. DeWitt Talmage 43
"Don't Be A Hermit" ... Ernest W. Fair 48

FEATURES

Coming Conventions ... 8
The Open Forum (Letters From Readers) ... 10
Across The Editor's Desk ... 14
Industry Newsletter ... 16
Washington Newsletter ... 22
Book Review—"Ecanomic Forcasting" ... 50
Industry News Briefs ... 51
The Back of The Book ... John G. Reynolds 78

DEPARTMENTS

New Products' Showcase ... 64
Buyers' Guide ... 65
Classified Advertising ... 66
Professional Cards ... 67
Advertisers' Index ... 77

FRONT COVER

OFFICERS & DIRECTORS, TEXAS TELEPHONE ASSOCIATION: Front Row (all seated) (l. to r.): J. B. Haley, executive sec.; Marion A. Clay, Lufkin Tel. Co., first vice pres.; D. G. Gardner Jr., Nocona Tel. Co., pres.; W. S. Bain, Mid-Texas Tel. Co., second vice pres.; Pam D. Grinstead, Kerrville Tel. Co., treas. Second Row (l. to r.): R. B. Still, Kansas City, past pres. of Texas Tel. Assoc.; D. H. Comparette, Kerrville Tel. Co.; W. G. Wright, General Tel. Co., of the Southwest; J. T. Chambers, Tenaha Tel. Co.; A. L. Robb, Electra Tel. Co.; Guy Smeiser, Northeast Texas Tel. Co.; W. G. Winters, Texas Tel. & Tel. Co.; Clive Haas; Big Timber, Mont., first vice pres. of the USITA; T. A. Singer, West Texas Tel. Co. Back Row (l. to r.): H. Y. Price Jr., San Marcos Tel. Co.; Oscar Burton, Gulf States Tel. Co.; Charles A. Hendrix, Brazoria Tel. Co.; Fabian Bearden, Home Tel. & Electric Co.; R. A. Goodson, Southwestern Bell Tel. Co.; and R. S. Burton, Gulf States Tel. Co. Directors not pictured include E. H. Danner, General Tel. Co., of the Southwest; Claud Gilmer, Rocksprings Tel. Co.; Cliff R. Dowd, Hawkins Tel. Co.; and D. T. Strickland, Southwestern States Tel. Co. All of the above are officers and directors of the Texas Telephone Association except R. B. Still and Clive Haas.

looking for
EXPERIENCED
technical personnel?

No need to look outside your organization when trained, technically qualified personnel within your own company can be upgraded to fill more important jobs. These Rider books designed for industrial upgrading are now **proving** themselves in training programs now being conducted by the nation's top firms—telephone companies, manufacturers, utilities.

"PICTURE BOOK" COURSES IN BASIC ELECTRICITY — BASIC ELECTRONICS

This is the fabulous "Common Core" training program so successfully used by the U. S. Navy to teach over 25,000 Navy students the basics of electricity and electronics. Now for the first time this material is available for civilian training programs. Over 2,000 big "Show-how" drawings make every phase **picture** clear.

Every page covers one complete idea, with at least one big drawing on that same page to illustrate and explain it. "Demonstrations," plus review pages at the end of each section, highlight the important points . . . make each topic completely understandable.

BASIC ELECTRICITY

by Van Valkenburgh, Nooger & Neville, Inc.

Vol. 1 and 2 cover DC components and circuits. **Vols. 3 and 4** cover AC components and circuits. **Vol. 5** covers AC and DC motors and electricity.

Paper Bound: 5 Vols. 624 pages—per set...**$10.00**

Cloth Bound: All 5 vols. bound in a single volume **$11.50**

BASIC ELECTRONICS

by Van Valkenburgh, Nooger & Neville, Inc.

Vol. 1 covers Diodes and Power Supplies. **Vols. 2 and 3** cover Amplifiers and Oscillators. **Vols. 4 and 5** cover Transmitters and Receivers.

Paper Bound: 5 (6" x 9") Vols. 560 pages—per set **$10.00**

Cloth Bound: All 5 vols. bound in a single volume — only **$11.50**

FUNDAMENTALS OF TRANSISTORS

by Leonard Krugman

A clear, authoritative explanation of this new electronic miracle, showing transistor characteristics and operation. Written by one of the pioneers in transistor development. 144 pages. Illus...**$2.70**

BASIC VACUUM TUBES AND THEIR USES

by John F. Rider and Henry Jacobwitz

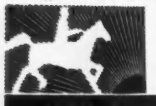
A simplified introduction to basic vacuum tube development, the book carefully examines, step-by-step, the various basic types, including actual tube construction, characteristic curves and tube constants, and applications. Clear, "show-how" illustrations. 208 pages. Illustrated. Paper Bound: **$3.00.** Cloth Bound: **$4.50**

ELECTRONICS TECHNOLOGY SERIES

edited by Alex. Schure, Ph.D., Ed.D.

An economically priced series of books explaining the basic concepts and principles of individual phases of electronics technology. Each book deals with a specialized subject.

#166	RC & RL Time Constant	Only $ .90
#166-2	FM Limiters & Detectors	Only $ .90
#166-3	Frequency Modulation	Only $ .90
#166-4	Crystal Oscillators	Only $1.25
#166-5	A-M Detectors	Only $1.25
#166-6	Limiters & Clippers	Only $1.25
#166-7	Multivibrators	Only $ .90
#166-8	R-F Transmission Lines	Only $1.25
#166-9	Amplitude Modulation	Only $1.25
#166-10	Blocking Oscillators	Only $1.25
#166-11	Wave Propagation	Only $1.25
#166-12	Superheterodyne Converters & I-F Amplifiers	Only $ .90
#166-13	L-C Oscillators	Only $1.25
#166-14	Antennas	Only $1.50
#166-15	Inverse Feedback	Only $ .90
#166-16	Resonant Circuits	Only $1.25



Order your examination copies of these books tailored to industrial training problems. Write for free catalog.

JOHN F. RIDER PUBLISHER, INC.
116 West 14th Street New York, N. Y.

COMING CONVENTIONS

INDIANA Telephone Association, Claypool Hotel, Indianapolis, May 8-9.

WISCONSIN State Telephone Association, Hotel Loraine, May 15-16.

ILLINOIS Telephone Association, Hotel Pere Marquette, Peoria, May 22-23.

KANSAS Telephone Association and **MISSOURI** Telephone Association, Town House Hotel, Kansas City, Kans., May 27-28.

PENNSYLVANIA Independent Telephone Association, Buck Hill Falls Inn, Buck Hill Falls, June 4-5.

MAINE Telephone Association, **NEW HAMPSHIRE** Telephone Association, and **VERMONT** Telephone Association, Wentworth-by-the-Sea Hotel, Portsmouth, N. H., June 4-6.

CALIFORNIA Independent Telephone Association, Ambassador Hotel, Los Angeles, June 5-6-7.

WASHINGTON Independent Telephone Association, and **OREGON** Independent Telephone Association, Davenport Hotel, Spokane, Wash., June 13-14-15.

NEW YORK State Telephone Association, Scaroon Manor, Schroon Lake, June 17-19.

TENNESSEE Telephone Association, Hermitage Hotel, Nashville, Sept. 12-13.

ARKANSAS Telephone Association, Arlington Hotel, Hot Springs, Sept. 16-17.

MICHIGAN Independent Telephone Association, Hotel Pantlind, Grand Rapids, Sept. 17-19.

ROCKY MOUNTAIN Telephone Association, Hotel Utah, Salt Lake City, Sept. 18-20.

WEST VIRGINIA Independent Telephone Assn., Blackwater Lodge, Davis, Sept. 30-Oct. 1.

NORTH CAROLINA Independent Telephone Association, Carolina Hotel, Pinehurst, Oct. 3-4.

UNITED STATES Independent Telephone Association, Conrad Hilton Hotel, Chicago, Oct. 14-16.

SOUTH CAROLINA Independent Telephone Association, Clemson House, Clemson, Nov. 4-5.

VIRGINIA Independent Telephone Association, Roanoke Hotel, Roanoke, Oct. 24-25.

OKLAHOMA Telephone Association, Huckins Hotel, Oklahoma City, Nov. 21-22.

FLORDIA Telephone Association, The Balmoral, Miami Beach, Dec. 2-3.

A Proclamation

★ ★ ★

Independent Telephone Week

Whereas, *Although Independent telephone companies were in existence in the United States several years prior to 1897, it was sixty years ago that these companies became organized and recognized as an industry and the United States Independent Telephone Association was given birth; and*

Whereas, *In the intervening years the Independent segment of the telephone industry has prospered and grown and today Independent companies serve 9,000,000 telephones and have an aggregate plant investment of $2,325,000,000, more than 100,000 employees and 200,000 stockholders; and*

Whereas, *There are 4,400 Independent companies which provide telephone service through 10,870 public telephone exchanges to people living in two-thirds of the geographical area of the United States and its territories; and*

Whereas, *Independent telephone companies and their manufacturers are entitled to the credit for numerous significant technological developments in the art of telephony, such as the dial telephone, selective ringing, subscriber toll dialing, and automatic toll ticketing; and*

Whereas, *Independent telephone companies together with their manufacturers and suppliers and related firms are a vital, vibrant part of the American free enterprise system and their importance to the economic and social welfare of the United States should be officially proclaimed; and*

Whereas, *It seems fitting that a suitable period should be designated and set aside for due observance of the sixtieth anniversary of Independent telephony in this country;*

Now Therefore, *In accordance with the powers vested in me as President of the United States Independent Telephone Association, I hereby issue this proclamation establishing the week of September 8, 1957, as INDEPENDENT TELEPHONE WEEK and request all Independent telephone companies and their manufacturers, suppliers and related firms and the public generally to pause in their appointed rounds in order to recognize and pay tribute to the loyal men and women who have made our industry great, to contemplate their achievements extending over sixty years of the country's history, to give thanks that a calling so essential to the public welfare is permited to flourish in an atmosphere of freedom in a free nation, and to take such further action to commemorate our sixtieth anniversary as may seem fitting and proper.*

Dated this 1st day of May, 1957, A. D.

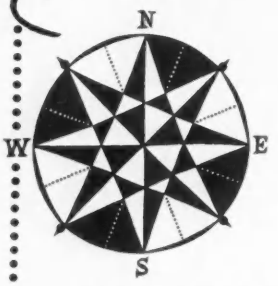
ATTEST:

UNITED STATES INDEPENDENT TELEPHONE ASSOCIATION CORPORATE SEAL STATE OF ILLINOIS

George C. Richert — *Secretary*

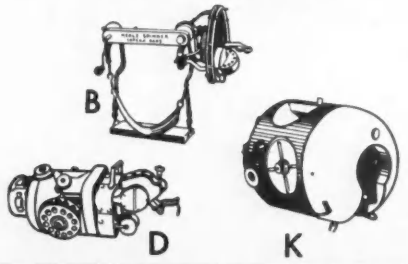
Duncan C. Power — *President*

TO THE NORTH
TO THE EAST
TO THE SOUTH
TO THE WEST



YES, IN EVERY DIRECTION YOU'LL SEE NEALE SPINNERS OUT PERFORMING ALL OTHERS —

—THE RESULT OF YEARS OF EXPERIENCE IN THE FIELD PERFECT DESIGN THE FINEST MATERIALS SUPERB WORKMANSHIP AND THE HIGHEST OF MANUFACTURING STANDARDS



CABLE SPINNING EQUIPMENT CO.
3100 TOPEKA AVE.
TOPEKA KANSAS
Serving the growing Independent telephone industry
UNITED STATES INDEPENDENT TELEPHONE ASSOCIATION
OVERSEAS SALES:
Ericsson Corp. of New York
Automatic Electric of Canada
Pirelli of Great Britain

The Open Forum

"New Article Coming Up"

TO THE EDITORS: — ". . . in a recent issue we found this comment — 'The answer to this question can be found in a three part article in the July, August, and November, 1954, issues of the *Fortnightly Telephone Engineer* magazine entitled: *The Dial Hand Test Set as an Effective Tool for Fault Location.* In this article John S. Reed does the telephone industry a great service by describing and, with 38 figures, illustrating a number of everyday applications of the hand test set of vital concern to plant maintenance men. This practical explanation is recommended reading to all who desire to cash in on the results that are possible to secure from a small investment in simple test equipment.'

"Are reprints or back numbers containing these articles available?"

R. McGregor,
Alba, Michigan.

Due to hundreds of requests Mr. Reed is rewriting this article. It will be published in a future issue of "Telephone Engineer & Management."

"We Sent It To Weston"

TO THE EDITORS: — ". . . On page 95 of October, 1956 issue it is mentioned that pamphlets are available from the Weston Electrical Instrument Corporation. The pamphlets are The Instrument Sketch Book and Electrical Measuring Instruments — Technical Monograph TM-101. I would like very much to procure these. The address of the Weston Corp. is unknown to me. Would it be possible for you to re-direct this request to the company please?

"It may be of interest to you to know that *Telephone Engineer & Management* has a good number of readers among the engineering staff of the P.M.D. Dept. in Queensland."

J. R. Griffiths, Engineer,
Cable Protection Division,
G.P.O.,
Brisbane, Australia

"Just Doing Our Job"

TO THE EDITORS: — ". . . . We at Trussville Telephone Company have been ardent readers and boosters of *Telephone Engineer & Management* since we came here in August of 1946. Being ourselves small operators, we appreciate your policy of devoting regular coverage to problems of the small Independents as well as the larger ones.

You were very kind to make favorable mention of our program in your issue of February 1, 1957, for which we are extremely grateful. Would it be possible for you to furnish us four or five additional copies?"

Wm. F. Fields, Pres.,
Trussville, Ala.

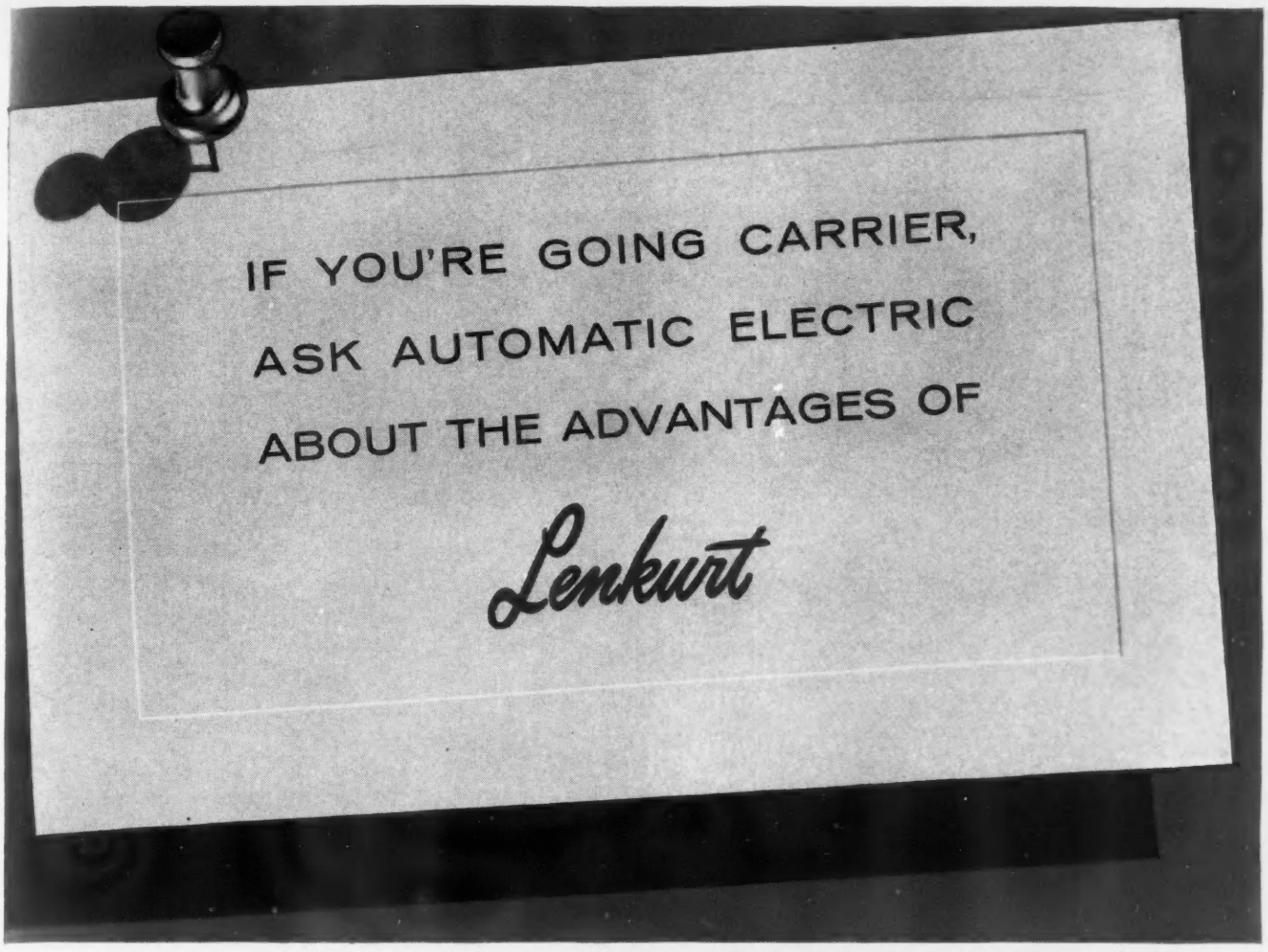
"Blame It On Our Gremlins"

TO THE EDITORS: — ". . . . On the front cover of the March 15 issue of the *Telephone Engineer and Management* appears a picture taken in Minneapolis during the Minnesota Telephone Association Convention. Those of us who appear in this picture were very pleased with the quality of the picture and flattered by the position in your magazine which you accorded it. I have talked with the other individuals on this picture and they have asked me to express their appreciation of your consideration in affording such prominence to our group.

"I wish to respectfully call your attention to an omission of the name of one of the individuals and the misspelling of the name of another. The individual omitted is the third man from the left and his name is Mr. Armin Koch, Northwestern Bell Telephone Co., St. Paul, and the second individual from the left is Mr. Kenneth Bresin, whose name is misspelled.

"I would appreciate receiving one-half dozen reprints of this photo for personal use . . ."

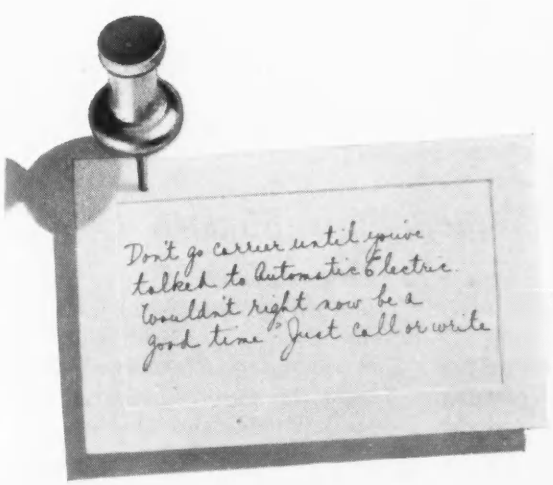
B. D. Morton,
Independent Company
Relations Engr.
Northwestern Bell Tel. Co.,
Minneapolis, Minn.



. . . **BECAUSE** Lenkurt Carrier is the simplest, fastest, most economical way to add profitable new circuits, using present wires. Only with Lenkurt Carrier do you benefit from advanced engineering features like these: direct interconnection at carrier frequencies . . . exclusive "building-blocks" concept of interchangeable, plug-in components . . . utmost simplicity of installation, maintenance and expansion.

. . . **BECAUSE** Automatic Electric offers you Lenkurt Carrier in one complete package—engineered, furnished and installed. We take complete responsibility until your system is operating smoothly.

. . . **AND BECAUSE** Lenkurt Carrier Systems are engineered *by* telephone men *for* telephone company operations.



Automatic Electric Sales Corporation,
(HAymarket 1-4300) 1033 West Van Buren Street,
Chicago 7, Illinois. *In Canada:* Automatic Electric Sales
(Canada) Ltd., Toronto, Ontario. *Offices in principal cities.*

AUTOMATIC ELECTRIC

A MEMBER OF THE GENERAL TELEPHONE SYSTEM

ONE OF AMERICA'S GREAT COMMUNICATIONS SYSTEMS

New A-Line models range from ½-ton Pickups through 33,000 lbs. GVW Six-Wheelers.

NEW ACTION-STYLING! MORE USABLE POWER!

Here is the crowning achievement of fifty years of quality truck production—the great new Golden Anniversary INTERNATIONAL Trucks!

They're *Action-Styled* with fresh, clean functional lines that set a new style pace.

They're powered by new engines that put out more *usable* horsepower—including the most powerful "six" available in its field! They have exclusive new cab mountings for quieter, more level ride. New brakes, new steering, new frames—and many other new features.

The result is a new line of trucks that—more than ever before—are built to cost *least* to own!

See and drive these newest INTERNATIONALS *today!* International Harvester Company, Chicago.

Trucks Unlimited...Powered for Modern Traffic...Plus Modern Comfort

Handsome "Golden Jubilee" Pickup with the *longest* all-steel body in its class. Only Panel with third door. New 8-passenger Travelall® models. New cab-forward models with ideal 89-inch BC dimension. Tractors to 48,000 lbs. GCW. Wide range of all-wheel-drive trucks.

Redesigned engines produce *increased* power without strain from new combustion chamber and valve position . . . more usable power that's "bred for the job". . . at low rpm to keep operating and maintenance costs low. New quick-starting 12-volt ignition.

Biggest windshield—1,181 sq. in.—and *widest* cab in their class! New "Silent-Vent" door wings. New, wider front and rear springs. Exclusive level-riding 5-point cab mounting. Bigger brakes with more lining area, larger cylinders and boosters for quicker, easier stops.

Other INTERNATIONALS, to 96,000 lbs. GVW, round out the world's most complete line.

NEW Golden Anniversary INTERNATIONALS

Cost least to own!

50 YEARS OF TRUCK QUALITY
1907 1957
INTERNATIONAL TRUCKS

Motor Trucks • Crawler Tractors • Construction Equipment
McCormick® Farm Equipment and Farmall® Tractors

"What's so different about Automatic's Transistorized Repeaters?"

Maintenance costs are virtually eliminated!

The AT-2 and AT-3 repeaters use transistors instead of vacuum tubes. Transistors far outlast tubes, and they're practically free of aging. You can forget about vacuum-tube failures.

You get all the benefits of the negative-impedance principle!

This provides a low-cost way to boost transmission quality on existing marginal trunks. And you save costs on new construction by using smaller gauge cable.

Automatic's repeaters consume less power!

In fact, our transistorized repeater requires only 1 watt. Naturally, heat dissipation is at a minimum. AT-2 and AT-3 repeaters are entirely self-contained; all power is supplied by the exchange battery.

Transistorized repeaters occupy far less space!

A transistor is only about the size of an eraser on a pencil. Eight repeaters, an entire bank, can be mounted side-by-side on a 19″ rack. They're only 5¼″ high too! The AT-2 is a "series-type" repeater; the AT-3 is a "shunt-type".

Even if you've never used voice frequency repeaters, you should have the facts on AT-2 and AT-3 Transistorized Repeaters. Just ask for Circular 1844A. Address:
Automatic Electric Sales Corporation
1033 West Van Buren St., Chicago 7.
Or Call HAymarket 1-4300.

AUTOMATIC ELECTRIC

A MEMBER OF THE GENERAL TELEPHONE SYSTEM

ONE OF AMERICA'S GREAT COMMUNICATIONS SYSTEMS

REX

TELEPHONE WIRE & CABLE *for all needs...*

Aerial and Duct are R. E. A. listed. Both Aerial and Duct and Direct Burial Cable utilize polyethylene insulation, aluminum shield and high molecular weight polyethylene jacket for top electrical values. Available in #26, #24, #22, or #19 AWG in 6 through 404 pairs.

Conductors insulated with high molecular weight polyethylene and jacketed with color coded, weather resistant vinyl provide good transmission values at low cost. Available in either #19 or #22 AWG with 3, 6, 11, or 16 pairs cabled over a high molecular weight polyethylene insulated high strength galvanized support wire.

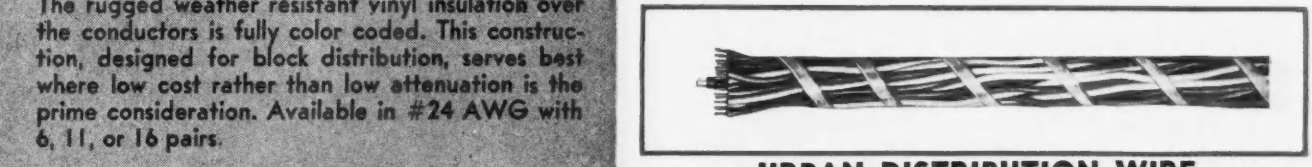
The rugged weather resistant vinyl insulation over the conductors is fully color coded. This construction, designed for block distribution, serves best where low cost rather than low attenuation is the prime consideration. Available in #24 AWG with 6, 11, or 16 pairs.

A high molecular weight, weather resistant polyethylene extrusion encompasses the parallel conductors. A raised ridge tracer provides polarity identification. The high strength conductors make possible long spans on lateral branches or drop runs. Available in #14 or #12 Copperweld or .083 galvanized steel.

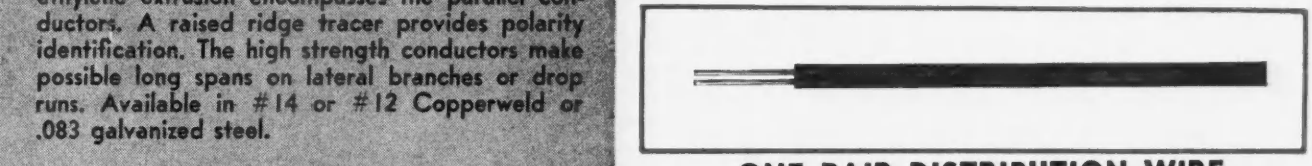
Solid, soft drawn bare copper conductors fully color coded with heat resistant polyvinylchloride insulation. All pairs twisted with varying lays to minimize cross talk and cabled to insure maximum flexibility. A tough, water resistant vinyl jacket in either brown or ivory provides good conductor protection for exposed insulation. Rip cord construction prevents damage to conductors in stripping. Available in #24 AWG with 6, 12, 16, 21, 26, 51 or 76 pairs.

EXCHANGE AREA CABLE

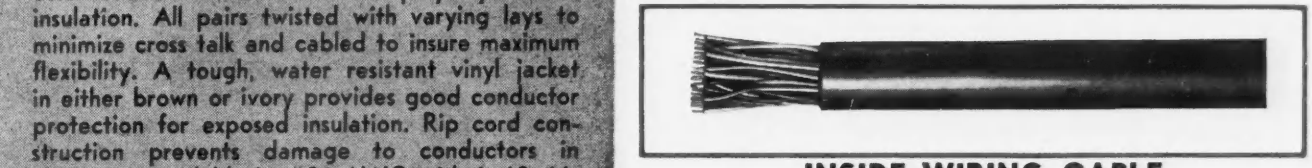
RURAL DISTRIBUTION WIRE



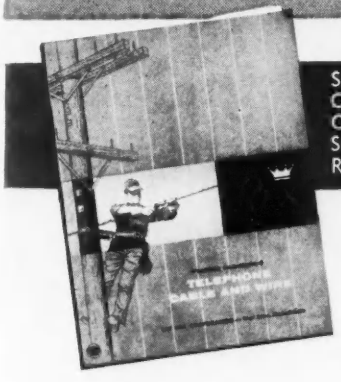
URBAN DISTRIBUTION WIRE



ONE PAIR DISTRIBUTION WIRE



INSIDE WIRING CABLE



SEND TODAY FOR THIS CATALOG — CONTAINS COMPLETE DATA AND SPECIFICATIONS FOR ALL REX WIRES AND CABLES.

INDEPENDENT

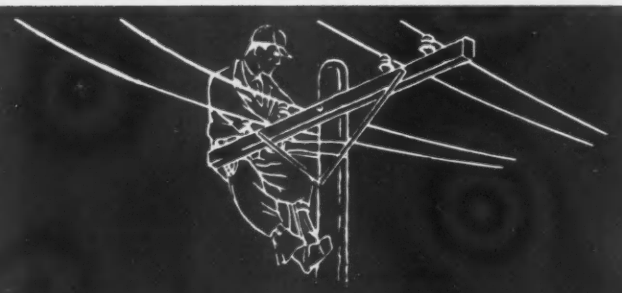
REX WIRE & CABLE

Manufactured by

THE REX CORPORATION

101 HAYWARD ROAD, WEST ACTON, MASS.

INDUSTRY NEWSLETTER



USITA Engineering Education Subcommittee urges applications for USITA Engineering Conference . . . Lincoln Tel. & Tel. plans common stock sales . . . Top executive changes announced by General Tel. Corp.

Engineering Education Subcommittee Reports on USITA Engineering Conference

MICHIGAN STATE University has announced that descriptive brochures, together with application forms, for the USITA Engineering Conference to be held this summer at Lansing, Mich., were mailed to member companies early in April.

The Kellogg Center for Continuing Education at Michigan State University has worked in association with the USITA Engineering Education Subcommittee to formulate plans and curricula for the conference to be held June 30 through July 27, 1957. The Conference was initiated at the request of the United States Independent Telephone Association and carries the complete endorsement of the Association. For obvious reasons, such a Conference can best be coordinated and presented by a participating educational institution rather than by the Association directly. Hence, Michigan State University was selected to perform the task. From all indications, Kellogg Center has equipped itself to fulfill the asignment in an admirable manner.

P. H. Henson, chairman of the USITA Engineering Education Subcommittee reports that the subcommittee is earnestly soliciting applications from all interested member companies for several reasons. First, sufficient interest must be displayed to guarantee an adequate enrollment for the first of these annual conferences. Secondly, widespread interest and response is necessary to assure that this Conference is properly designed to meet representative needs of all the operating companies, manufacturers and suppliers composing the Independent segment of the industry. Further, only through wholehearted participation on the part of member companies can this and similar programs be established on a recurring and permanent basis.

"From the outset of organization," Mr. Henson reports, "the USITA Subcommittee has proceeded on the premise that this Conference should be designed as an engineering refresher course applicable to established engineers rather than a basic instruction course to train engineers in the art. This philosophy has been maintained to the end that a professional approach to engineering techniques is indicated throughout the curricula and discussions. Through participation in this Conference, it is anticipated that the telephone engineer will develop a keener sense of appreciation for engineering economics, fundamental planning, elements of management decision, and of the problems of tomorrow — as well as the tools of solution. This Conference might therefore be defined as one which will take a reflective view of the past in telephone engineering and suggest methods for future effectiveness.

"While the Michigan State brochure provides information on the details of the Conference, the Subcommittee desired to use this medium to invite applications from all interested member companies. It is impossible to indicate by title or other classification the person or persons in the many companies who could benefit by participating in the Conference. There are no educational or experience requirements. By designing the Conference broad in scope and nature, it is the Subcommittee's sincere desire to offer the greatest assistance to the greatest number. The interest and support of all is solicited." — *If you desire further information write Mr. P. H. Henson, Chairman USITA Engineering Education Sub-Committee, Lincoln (Neb.) Tel. & Tel. Co.*

Lincoln Tel. & Tel. To Sell 68,750 Shares of Common Stock

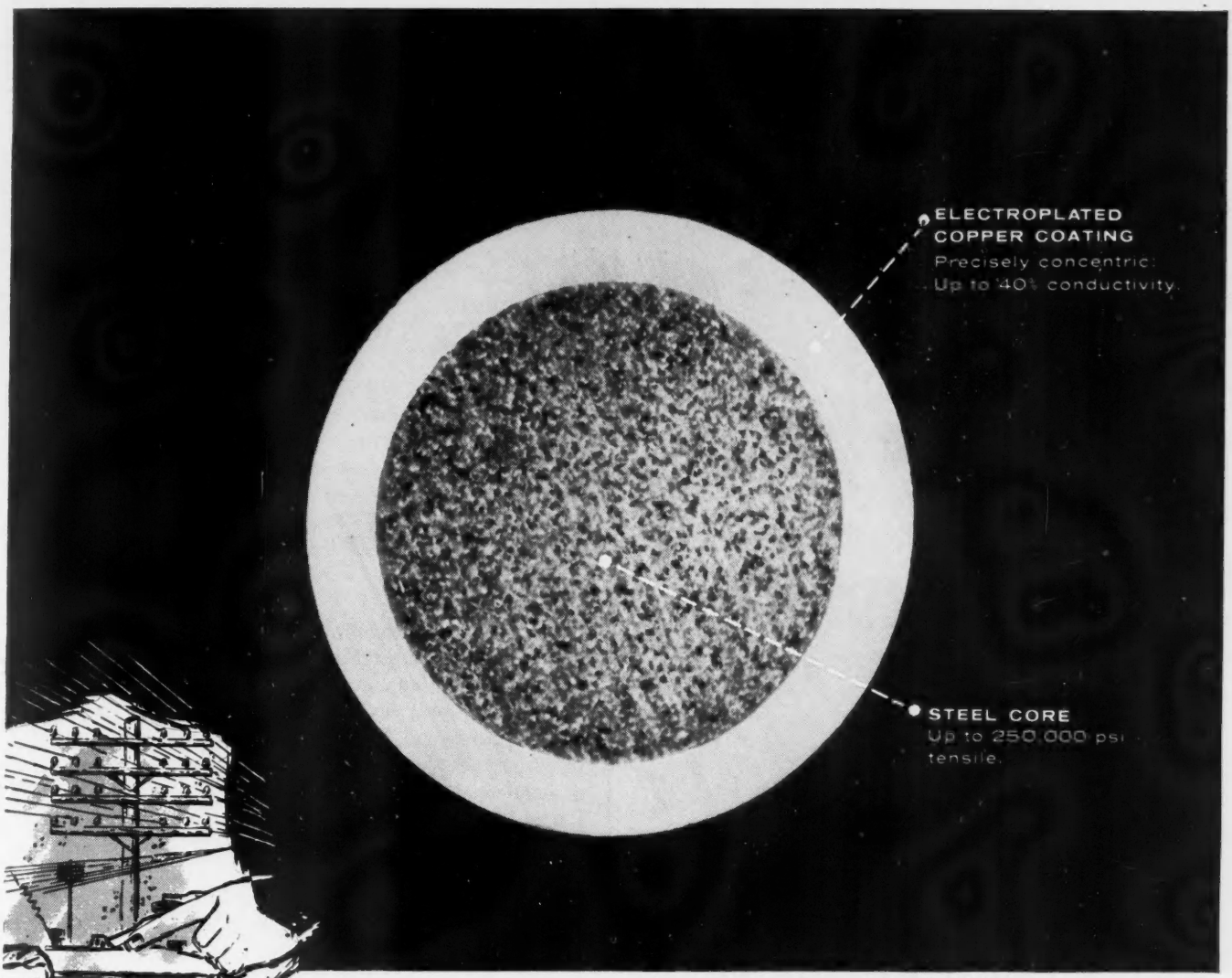
THE NEBRASKA State Railway Commission has approved request of Lincoln Telephone & Telegraph Co. to issue and sell 68,750 shares of its common stock.

Earlier, on February 5, company stockholders approved amendments to certificate of incorporation to increase authorized shares of common stock from 300,000 to 400,000, increasing par value from $16\frac{2}{3}$ to $25 per share and clarifying pre-emptive rights of common stockholders.

After SEC registration has become effective, company plans to issue subscriptive warrants to common stockholders on record as of April 10 offering right to purchase one additional share of common stock for every three shares held. Subscription rights and copies of prospectus mailed to stockholders April 19.

Unsubscribed shares will be offered for public sale by underwriters after subscription rights expire on about May 1. Underwriting group will be managed by Dean Wittmer & Co.

Funds from sale of stock will be used to retire



Photomicrograph enlargement of .104"—40% Copperply communications wire

COPPERPLY® COMMUNICATIONS WIRE

. . . new solution to old problems!

● Copperply, with its high strength steel core and concentric rust-proof coating, is ideal for long-span installation. And, it has the decided advantage of versatility to include future carrier circuits without additional line construction. Copperply conforms to ASTM Specification B-227-52 and can be installed in accordance with accepted construction practices.

In insulated wire applications, substantial savings can be realized both in the insulating process and subsequent line installation due to the availability of continuous 600 pound, non-welded lengths.

Your own experience will point to various other applications where the high strength, high conductivity and extreme uniformity of electroplated Copperply will do a better job and save dollars.

We are now producing Copperply communications wire in all standard sizes from No. 3 to No. 12 AWG, with either 30% or 40% conductivity and in both high and extra high strength grades. Check with your distributor, or write to National-Standard.

NATIONAL STANDARD

DIVISIONS: NATIONAL-STANDARD, Niles, Mich.; *tire wire, stainless, music spring and plated wires* • **WORCESTER WIRE WORKS, Worcester, Mass.;** *high and low carbon specialty wires*
WAGNER LITHO MACHINERY, Secaucus, N. J.; *metal decorating equipment* • **ATHENIA STEEL, Clifton, N. J.;** *flat, high carbon spring steels* • **REYNOLDS WIRE, Dixon, Ill.;** *industrial wire cloth*

TIME TESTED!

DEPENDABLE SERVICE SINCE 1897! That's the record of Kennecott lead-alloy sheathed Telephone Cable! Exacting quality control goes into *every* step of its manufacture. Rigorous tests check dielectric strength, insulation resistance, conductor resistance, capacitance, density and dimensions. You're *sure* this cable will retain its electrical properties over the years! Call the Chase sales office nearest you for complete information.

CHASE BRASS & COPPER CO., WATERBURY 20, CONN.
DISTRIBUTOR FOR

KENNECOTT WIRE & CABLE CO.

SUBSIDIARIES OF KENNECOTT COPPER CORPORATION

CHASE WAREHOUSES and OFFICES:

Atlanta	Cincinnati	Grand Rapids	Milwaukee	New Orleans	St. Louis
Baltimore	Cleveland	Houston	Minneapolis	Philadelphia	San Francisco
Boston	Dallas	Indianapolis	Newark	Pittsburgh	Seattle
Charlotte	Denver	Kansas City, Mo.	New York	Providence	Waterbury
Chicago	Detroit	Los Angeles	(Maspeth, L. I.)	Rochester	

Newsletter

(Concluded from page 16)

$2,800,000 in temporary bank loans and to finance dial conversions and company's general program of growth and service improvements.

Organizational Changes Announced by General Tel.

THE FOLLOWING organizational changes within General Tel. System were announced in New York last month by Donald C. Power, president.

Frederic E. Norris became vice president — Planning and Development on May 1. In this capacity Mr. Norris will be on staff of Mr. Power, reporting directly to him. Mr. Norris joined General's subsidiary company in California in 1924. Later he was made pres. of General Tel. Co. of Mich., and has been at the headquarters office in New York since Aug. of 1954 as vice president — operations.

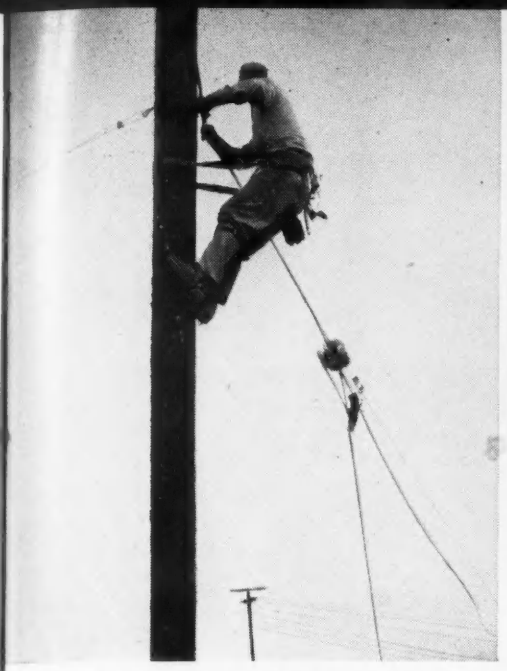
Walter G. Wright, pres. of General Tel. Co. of the Southwest, succeeded Mr. Norris in New York as vice pres. — operations, reporting directly to Mr. Power. Mr. Wright spent several years of his telephone career with International Tel. and Tel. on various assignments in all parts of the world. He joined General Tel. System as chief engineer for General Tel. Co. of Mich. In the fall of 1952 he was made operating vice pres. of General Tel. Co. of the Southwest, and on May 1, 1953 he was made pres. of that company.

Elmer H. Danner has been named pres. of General Tel. Co. of the Southwest, succeeding Mr. Wright. Mr. Danner started his telephone career in June, 1928 and became an employe of General Tel. System through merger of Theodore Gary & Co. with General. Mr. Danner has had various assignments in the telephone business, including presidency of Texas Tel. Co. and the Oklahoma Tel. Co. He was operating vice pres. for General Tel. Co. of the Southwest.

G. Howard Briggs has been named operating vice pres. for General Tel. Co. of the Southwest. Mr. Briggs joined General Tel. System in 1929 in California. From 1932 to 1935 he worked in Southwest company, later transferring to General Tel. Co. of California., where he later became a division mgr. In Sept., 1954, Mr. Briggs was transferred to General's headquarters office in New York, where he was director of commercial operations.

Worth Writing For

WRITE our Reader's Service Dept., or L. M. Eble, Jr., C & D Batteries, Inc., Dept TEM, Conshohocken, Pa., for your free copy of article — "The Pros and Cons of the Lead Calcium Battery." Article is packed with helpful data . . . Write Tony Lee Associates, Inc., P. O. Box 342, Dept. TE&M, Hubbert Bldg., 21 Muirhead Ave., Trenton 9, N. J., for copy of catalog sheet describing new "Wing-Ding" Hollow Wall Anchor. . . . Write our Readers' Service department for literature describing Phelps Dodge telephone wire and cable; and copy of "Survey Simplifier" for picking paystation locations.



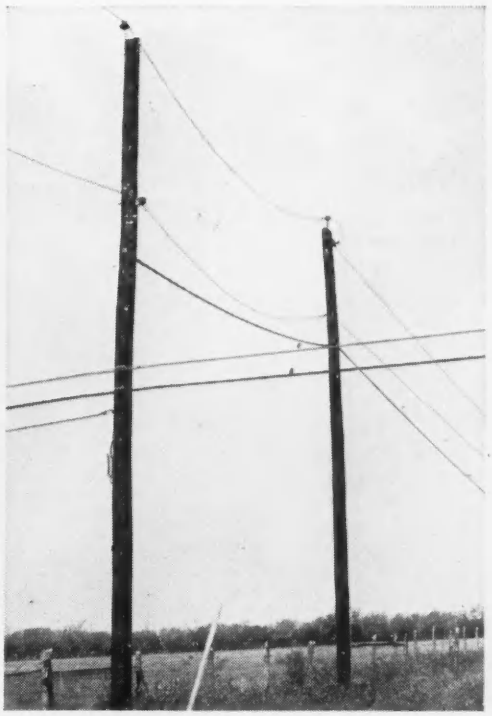
Aerial & Duct Cable. Tough polyethylene jacket defies abrasion, moisture, sunlight, weather. Cable is lightweight . . . easy to install and splice. Either regular or factory-assembled aerial cable available.

Self-supporting Cable. Same as Aerial & Duct Cable, except conductors are hard drawn, which lets cable be self-supporting without damage to jacket. Cable eliminates messenger and hardware expense.

Direct-burial Cable. Double polyethylene jacket makes this cable ideal for direct burial. It's tough, resists moisture, soil chemicals, fungi. Aluminum shield and armor add rodent, lightning protection.

See the Man from Anaconda–for telephone cable

Rural and Urban Distribution Wire. Plastic jacket gives full protection during installation, service. No over all jacket—pairs are color coded, readily accessible for taps, easy to splice.



Paper-lead Cable. Anaconda now supplies a full line of paper-lead telephone cable made to the same rigid standards of quality and performance that distinguish its plastic telephone cables.

Splicing Kits. Complete kits containing all required splicing materials plus full instructions for splicing and grounding Anaconda Telephone Cables are available. Order with your cable.

Everywhere—Anaconda offers "on call" service in telephone cable. Seven mills, strategically located across the country, back a national network of distributors to assure you prompt, accurate service on highest quality telephone cable. On your next job—ask your distributor for Anaconda cable. Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.

57333

ANACONDA®

"Sure glad w

...used Alphaduct Drop Wire...

...There's *one* job we'll never have to worry about"

That's right. Alphaduct means worry-free drops, in any lineman's language!

Alphaduct is designed to be the longest-lasting drop wire you ever put up. It's quality-made, and each type of Alphaduct is rigorously tested for built-in durability.

For instance, every day a random production sample of Alphaduct drop wire is put into a "P" clamp, and stretched—and *stretched*. In this test, there must be NO slipping of the jacket or the insulation, before the conductor finally breaks.

Then, there's the Insulation Compression test: pieces of Alphaduct are slowly crushed between two steel plates. Each conductor of Alphaduct twisted-pair must withstand a 1000-pound pressure—and parallel drop wire insulation must resist 1500 pounds of pressure before it breaks. Here is your assurance that Alphaduct won't slip through your fittings—and it won't be hurt when you clamp it *tight*.

Alphaduct gives you other advantages, too. The easy-handling carton keeps it orderly, down to the last foot. And Alphaduct is *dated* so that, years from now, you'll see how long it stayed up. All the way 'round—Alphaduct *saves you money*.

Make sure you have enough Alphaduct on hand...call Automatic Electric today. We have Alphaduct wires right in our warehouses—part of the speedy Supply service you'll always get by calling your A. E. representative or your nearest Automatic Electric Sales Corporation warehouse.

Automatic's 5 friendly warehouses:

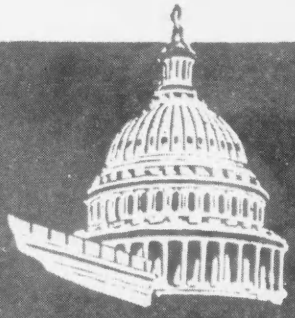
George Ferguson, Mgr. 1033 W. Van Buren St. Chicago 7, Ill. HAymarket 1-4300	"Michie" Hester, Mgr. 2915 Moore St. Richmond 21, Va. Tel. 6-9280	Ed. J. Chok, Mgr. 2360 N. W. Quimby St. Portland 10, Ore. CApital 3-7244	Fran Batcher, Mgr. 158 Corliss Avenue Johnson City, N. Y. Binghamton 7-8507	Gene Martin, Mgr. 2021 Main St. Kansas City 8, Mo. HArrison 1-4720

AUTOMATIC ELECTRIC

ORIGINATORS OF THE DIAL TELEPHONE

GENERAL SYSTEM INDEPENDENT

WASHINGTON NEWSLETTER



HIGHWAY reimbursement provision in danger if industry does not press for similar legislation at state level . . . Anti-trust division explains its interest in FCC's action on AT&T's proposed tariffs for lease and maintenance of private mobile radio systems.

Highway Reimbursement Provision

THE POINT that despite the passage of federal utility highway reimbursement legislation last year "Utilities and utility rate payers are in danger if they do not continue to press for similar legislation at the state legislation," has been emphasized by Austin L. Roberts, Jr., General Solicitor, NARUC.

Mr. Roberts, in a recent discussion of utility regulation, stressed also the role of utilities as excise tax collectors for the government and urged that complete repeal of the federal levies on communications and transportation services be continually worked for.

In citing the growth of utilities, and their differences from non-regulated industry, Mr. Roberts points out that "The utility industry is one of heavy capitalization and needs $2.50 to $3.50 of assets for each dollar of revenue, while unregulated industry as a whole needs only 50 cents. Manufacturing industry has been able to obtain 85 percent of its funds from internal sources, principally depreciation and reinvested earnings, while regulated industry has had to raise over two-thirds of its funds from the security markets.

"This is because utility earnings are at a lower rate than unregulated industry generally, because there is less depreciation expense by reason of the relatively long-lived characteristics of the utility plant, and because of the greater capital investment required by utilities . . . As a result of these fatcors, the utility industry, although it represents only about 13 percent of the capital of all industry, has raised 43 percent of all the new capital obtained through security issues in the postwar period."

Industry Representative Appears At Hearing on "750-Station Exemption"

SEN. JOHN KENNEDY (D., Mass.), Chairman of the Senate Labor subcommittee which has been holding hearings on proposals to amend the Fair Labor Standards Act, has introduced legislation which would end the 750-station exemption for switchboard operators under the minimum wage law and limit the exemption to operators providing telephone service through a switchboard located in the operator's home.

Senator Kennedy's bill was the latest of a number introduced in both the Senate and House, including several which also specifically call for ending the 750-station exemption.

Hearings were still being held by a House Labor subcommittee and are expected to continue for some time, but there were indications that the Kennedy bill would get some consideration on the floor of the Senate.

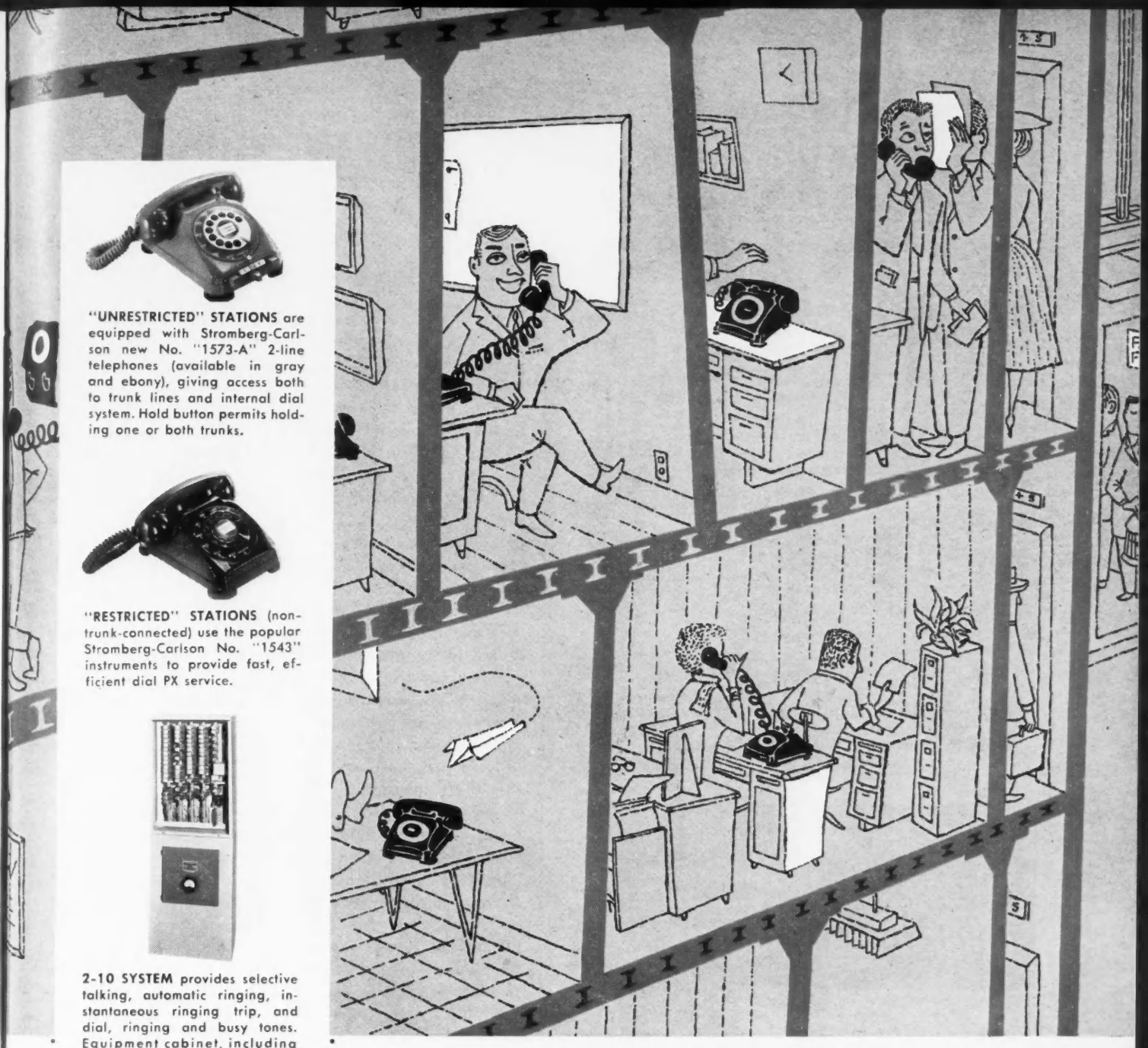
Witnesses who have appeared before both subcommittees have included spokesmen for the Independent telephone industry and the Communications Workers of America.

Clyde McFarlin, president of the Montezuma (Ia.) Telephone Co. and the Chairman of the Employment Relations Committee of the US Independent Telephone Association, has told both subcomittees that to abolish the exemption for switchboard operators in exchanges of fewer than 750 stations from the minimum wage provisions could force many of the very small telephone companies out of business. He said that such a repeal would result in very large rate increases to the telephone subscribers of the affected exchanges, that the adverse economic effect of such repeal upon the companies themselves would be crippling, and that economic conditions in the Independent industry require preservation of the exemption.

President Joseph A. Beirne of the CWA and other union witnesses have termed the exemption "unfair and discriminatory" and have declared that, in effect, affected operators "subsidize communities to assure them of telephone service."

Anti-Trust Division Checks FCC On Proposed AT&T Tariffs

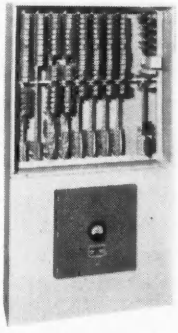
THE ANTI-TRUST Division of the Department of Justice has informed the FCC that the Commission's action on the proposed tariffs of the American Telephone & Telegraph Co. Long Lines Department for the lease and maintenance of private mobile radio systems "is of vital interest to the Anti-trust Division." The statement was made in a letter to the FCC by Assistant Attorney General Victor R. Hansen, who said the Justice



"UNRESTRICTED" STATIONS are equipped with Stromberg-Carlson new No. "1573-A" 2-line telephones (available in gray and ebony), giving access both to trunk lines and internal dial system. Hold button permits holding one or both trunks.

"RESTRICTED" STATIONS (non-trunk-connected) use the popular Stromberg-Carlson No. "1543" instruments to provide fast, efficient dial PX service.

2-10 SYSTEM provides selective talking, automatic ringing, instantaneous ringing trip, and dial, ringing and busy tones. Equipment cabinet, including battery eliminator, is 53½" high, 18¼" wide, 10⅛" deep. *Capacity is 2 simultaneous talking paths, 10 lines, up to 30 telephones, including extensions.*



4-20 SYSTEM offers the same features as the 2-10. Equipment cabinet, including battery eliminator, is 59" high, 32" wide, 10⅛" deep. *Capacity is 4 simultaneous talking paths, 20 lines, up to 60 telephones, including extensions.*

Here's dial PBX service
for your smaller business subscribers

You can give your commercial revenue a powerful boost with the Stromberg-Carlson 2-10 and 4-20 dial PBX systems.

These unattended systems are ideal for business and institutional subscribers which are growing too big for their present equipment, but do not need large systems. Small factories, banks, regional insurance offices and large law offices are but a few of your potential customers for a 2-10 or 4-20.

Call or write the Stromberg-Carlson representative in your area for descriptive literature and sales help.

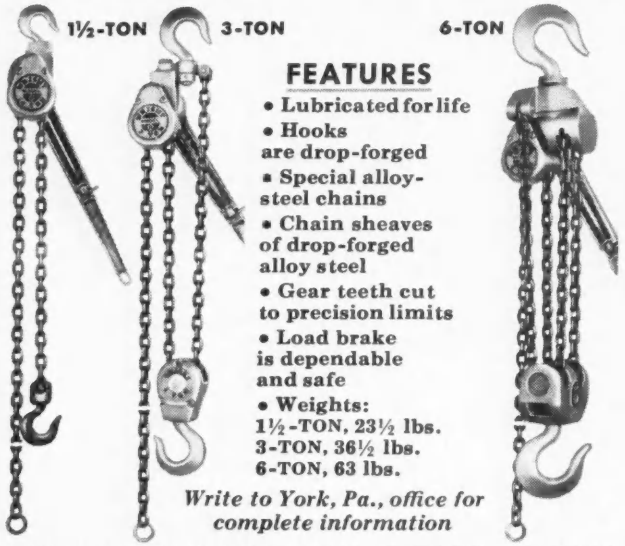
STROMBERG-CARLSON COMPANY

A DIVISION OF GENERAL DYNAMICS CORPORATION

Sales Offices: Atlanta 6, Chicago 6, Kansas City 8, Rochester 3, San Francisco

NEW WRIGHT Type "C" Pull-A-Ways

THREE SIZES—1½, 3 and 6-Tons



FEATURES

- Lubricated for life
- Hooks are drop-forged
- Special alloy-steel chains
- Chain sheaves of drop-forged alloy steel
- Gear teeth cut to precision limits
- Load brake is dependable and safe
- Weights: 1½-TON, 23½ lbs. 3-TON, 36½ lbs. 6-TON, 63 lbs.

Write to York, Pa., office for complete information

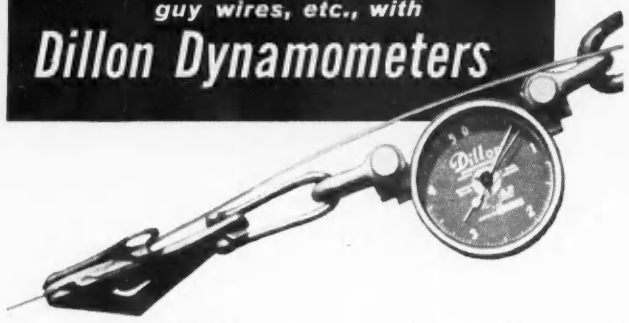
Wright Hoist Division
AMERICAN CHAIN & CABLE
ACCO

York, Pa., Atlanta, Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.

PRECISE TENSIONING

of conductor, messenger, or guy wires, etc., with

Dillon Dynamometers



Why put up with "Oscillation" and "Sight and Sag" methods of setting tension when it is possible to employ a means of *precise* tensioning that is *not* subject to human error? The Dillon Dynamometer is the answer to this need!

Above photo illustrates ease with which the Dillon Dynamometer accurately checks tension in a new line going up or in an old line standing *without cutting the wire*. We will be happy to supply illustrated details upon request.

Available in 13 capacities from 0-500 to 0-100,000 lbs., Dillon Dynamometers also check effective holding strength of anchors, strength of insulators and cross arms, weight of cable reels and poles and perform scores of other important tests. Compact, light and sturdy, all Dillon Dynamometers are overload protected, equipped with max. hand, and certified accurate.

W. C. Dillon & COMPANY, INC.

1459AA Keswick St., Van Nuys 40, Calif.
(Suburb of Los Angeles)

Washington

(Concluded from page 22)

Department "would be forced to consider seriously appropriate action" under last year's Justice Department-Bell System consent decree should the FCC allow the tariffs to become effective."

After public release of the Anti-trust Division's letter to the FCC, AT&T issued a statement declaring that "The position taken by the Anti-trust Division . . . is not clear. If it is now the view of the division that AT&T is somehow prevented by the final judgment (consent decree) from leasing and maintaining private mobile systems under lawfully effective tariffs, this is contrary to the terms and intent of the judgment."

The Justice Department letter had stated that "At the outset, the AT&T judgment generally sought to limit AT&T and its subsidiaries to 'common carrier communications services.' Accordingly, should the Commission approve AT&T's proposed tariff, and should AT&T or its operating subsidiaries engage in the business of leasing and maintaining private communications systems to private users, this division would be forced to consider more seriously appropriate action under the AT&T judgment.

"Apart from (the) AT&T judgment," the letter went on, "private communications is a young and growing field. It provides a vital service in our complex society. Therefore, there is a major public interest in assuring the adequacy and efficiency of this service. Vigorous and healthy competition is essential to a growing and expanding industry. Approval of the proposed 'tariff' by the Commission might substantially lessen the competition which now exists in the leasing, as well as the manufacture and sale, of equipment for use in private communications systems. Acceptance by the Commission of the AT&T 'tariff' might well extend the Bell System in this industry at the expense of its many private competitors. Accordingly, the Commission's action on this pending 'tariff' application is of vital interest to the Antitrust Division."

AT&T's statement taking issue with the letter declared that "It has been clearly understood that the leasing and maintaining of private mobile systems is permitted by the judgment where the charges are subject to public regulation. Under the judgment the companies may furnish 'common carrier communications services,' which are defined to include 'communications services and facilities, other than message telegram service, the charges for which are subject to public regulation. . . .'

"The issue before the FCC . . . is whether the furnishing of private mobile systems, as contemplated by the AT&T tariff schedules, constitutes 'a common carrier communications service subject to the jurisdiction of the Commission under the Communications Act.' If this issue is answered in the affirmative, we do not see how any question can possibly arise under the judgment."

Where is the Guy who put up this guy?

He's doing something else—
maybe he's putting up another one.
Anyway, he did this job all alone
in less than five minutes—
by himself.

STRANDVISE is made
for strand sizes 3/16", 1/4", 5/16", 3/8", and 7/16"
NO MATTER THE GRADE.
Please pick your size, fill in
the coupon and mail it today.

Reliable

Reliable Electric Company
West Carroll Avenue
Chicago 12, Ill.

Mr. Reliable:

WE DON'T BELIEVE IT BUT—we want to give STRANDVISE a fair trial. You may send 4 of them size ( ) without charge. Better send your instructions for installing and a catalog-price sheet, too.

Signed_____

Company_____

Street No._____

City_____ State_____

INDEPENDENT
60 YEARS OF INDEPENDENT TELEPHONY
1897-1957

This STRANDVISE guy was put up complete before any tensioning tools were applied to the strand

New improved T

dTFA headset

available from NORTH!

Your requirements for an operator's headset with a high degree of sensitivity, high standards of transmission, operator comfort, and complete flexibility of adjustment can now be fully met with the new improved TFA headset now in stock at North.

Switchboard Plugs on "In Stock" Availability

A full range of 2, 3, and 4-conductor TFA Switchboard plugs is also available from stock, as well as special plugs and colored plug sleeves.

NORTH ELECTRIC COMPANY

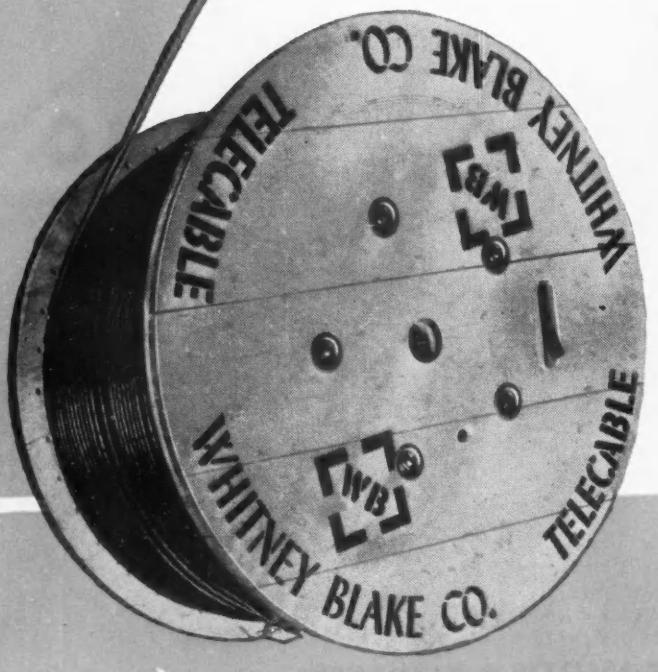
655 SOUTH MARKET STREET • GALION, OHIO

Buy Right Now and . .

SAVE for YEARS

WITH WB

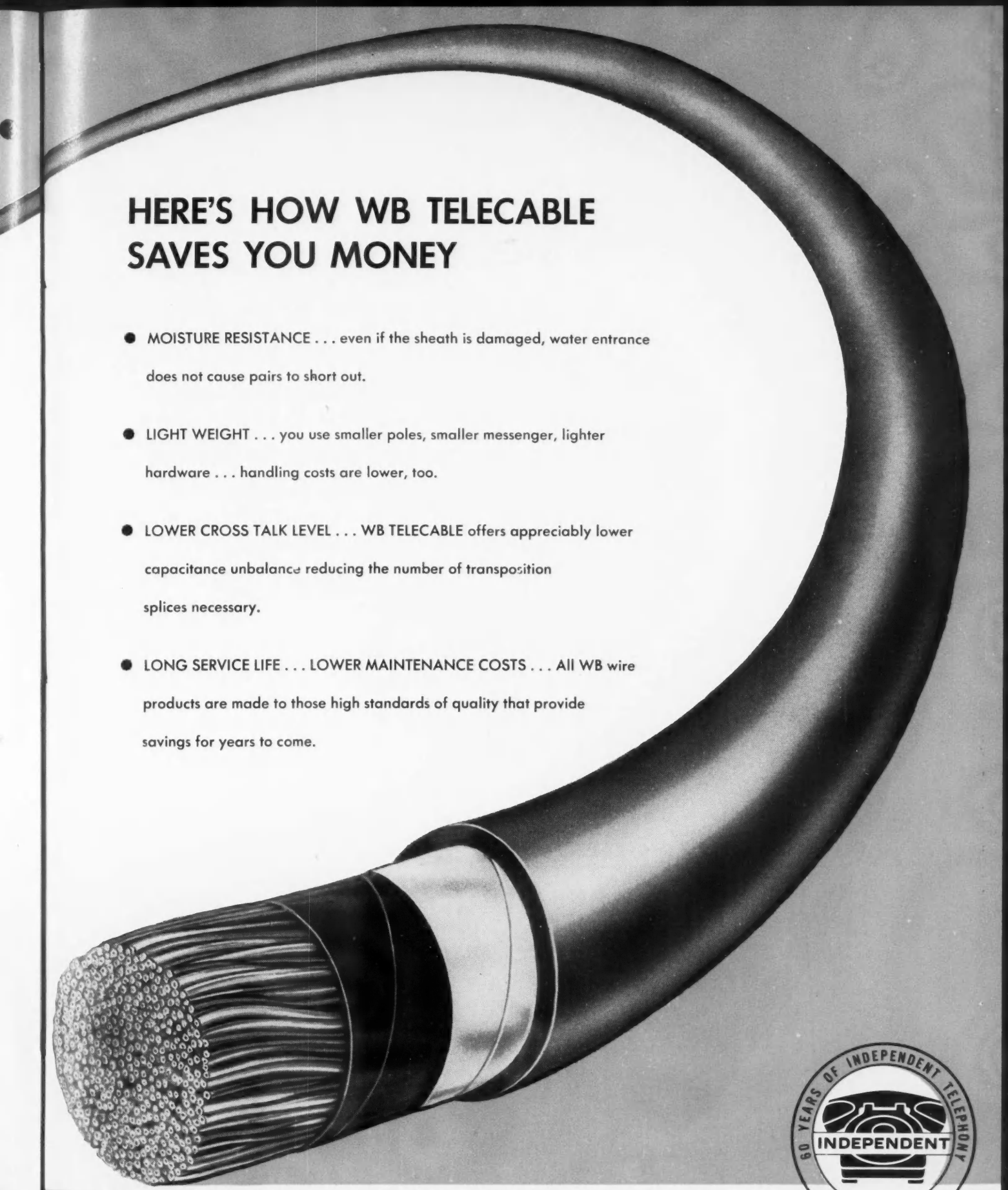
TELECABLE



THE STANDARD FOR QUALITY AND SERVICE

WB

WB has that which others have yet to gain . . . EXPERIENCE



HERE'S HOW WB TELECABLE SAVES YOU MONEY

- MOISTURE RESISTANCE . . . even if the sheath is damaged, water entrance does not cause pairs to short out.
- LIGHT WEIGHT . . . you use smaller poles, smaller messenger, lighter hardware . . . handling costs are lower, too.
- LOWER CROSS TALK LEVEL . . . WB TELECABLE offers appreciably lower capacitance unbalance reducing the number of transposition splices necessary.
- LONG SERVICE LIFE . . . LOWER MAINTENANCE COSTS . . . All WB wire products are made to those high standards of quality that provide savings for years to come.

60 YEARS OF INDEPENDENT TELEPHONY
INDEPENDENT
1897 — 1957

Well Built Wires Since 1899

©1957

WHITNEY BLAKE COMPANY

NEW HAVEN 14, CONNECTICUT

Independent telephones help you reach all America

The patient is doing fine. And so is Mom—thanks to that reassuring telephone call. In so many ways each day, the swift, personal, *indispensable* telephone proves its value. Haven't you a call to make . . . right now?

Throughout two-thirds of the entire area of the nation, the service you depend on is provided by 4,500 independently owned and operated telephone companies. Working together to serve you better.

60 Years of Growing Service 1897-1957

INDEPENDENT TELEPHONE COMPANIES of America

United States Independent Telephone Association • Pennsylvania Building • Washington, D.C.

EDITORIAL

USITA Engineering Conference

AE WE mentioned a few pages frontward, the Michigan State University at Lansing has mailed descriptive brochures and application forms for the USITA Engineering Conference to all USITA member companies.

We sincerely hope that by this time the brochures have been carefully read, and Michigan State University knows many industry members will be attending the four-week session at Kellogg Center on the campus of Michigan State University, June 30 through July 27.

As we see it, such activity with the brochures and the application forms is as it should be. Such interest must be displayed and such action must be taken if this first annual USITA Engineering Conference is to be successful.

We well know that to some the information from Michigan State University may suggest little significance and quite conceivably could be shrugged off as just another effort to sustain college faculty personnel through the summer vacation period. At the same time, others may visualize the program as another "charm school" approach to the solution of all things for all men. In this age of educational emphasis these opinions may be sad — but wise — commentaries.

After reviewing the need for the USITA Engineering Conference and studying the brochure from Michigan State, we believe that whatever the objective and accomplishments of other conference-type programs may be, many persons can benefit by participating in the USITA Engineering Conference.

We believe this because our study indicates the Engineering Conference will treat the subjects and principles many telephone industry leaders consider of signal importance to the future welfare of the industry.

The USITA Subcommittee on Engineering Education has indicated the Conference curricula is the natural outgrowth or recognition of several fundamental needs.

One of these needs springs from the fact that the Independent telephone industry has spent and is spending tremendous amounts of investment capital to provide an ever-improving telephone service to an ever-expanding populace. This expansion and modernization definitely obligates the industry to develop programs that will assist and guide personnel charged with the direct responsibility of planning, designing, specifying and integrating plant additions and replacements.

It has been said that engineers tend to obsolete with equipment and methods. Presumably, this philosophy holds that an engineer, familiar with and proficient in, the engineering of magneto or common battery switchboards cannot be proficient in the engineering related to dial switchboards. Perhaps as an extreme example this statement has some credence.

However, if the industry can assist the telephone engineer in bridging the gap between formal education or his years of operating experience to the position in which he finds himself today, it cannot only equip him to more effectively and more efficiently discharge his responsibilities, but also the industry can develop an engineer who can meet any new situation or development.

This leads to the obvious conclusion that if the Independent telephone industry is to make prudent capital outlays for plant additions and improvements, it must depend in an increasing degree upon the knowledge, integrity and vision of its technical people.

It seems to us that industry support of the forthcoming USITA Engineering Conference is a major step toward the prevention of future bungling of an important job.

The USITA Subcommittee asserts the Conference has been designed to come to grips with the problems of today and tomorrow. Our advance look at the planned curricula indicates Committee Chairman P. H. Henson is right when he says — "*Presentations will enhance not only the participant's technical understanding but also his economic and social appreciation . . .*"

This is an excellent goal. It is a goal we feel sure can be reached if sufficient interest is displayed to guarantee an adequate enrollment for the conference.

Of course, we hope your registration has been mailed. If it has been delayed because you have questions, we feel sure a letter to *P. H. Henson, Chairman, Engineering Education Sub-Committee, Lincoln (Neb.) Tel. & Tel. Co.*, will bring you some right answers.

(The foregoing editorial, although copyrighted, may be reprinted in whole or in part without charge, provided credit is given this publication and a copy of such reproduction is filed with this publication. This legend need not appear on the publication.)

Every anchor man prefers the CHANCE 8-WAY

From every angle, there are good sound reasons for specifying Chance anchors from Buckeye. Eight steel blades that expand to form a cone-shaped square assure you of maximum holding power. No hinges or mechanical devices to hinder smooth operation. Just a few blows expand it with no danger of breakage. Chance anchors are comparatively light weight for easier handling. Quality control means uniformity in materials and fabrication. Insist on Chance anchors from Buckeye . . . your lines will be more firmly anchored at a price you'll appreciate.

You Know it's RIGHT when You Specify CHANCE from

BUCKEYE

TELEPHONE & SUPPLY CO.

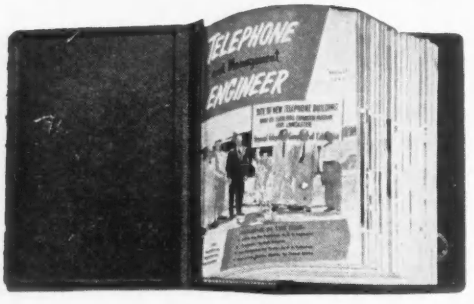
Your Friendly Supply House

P.O. Box 5707 Columbus 21, Ohio

Now you can preserve and protect your

TELEPHONE ENGINEER MAGAZINES

with this sturdy, full-sized BINDER



HOLDS ALL ISSUES FOR A FULL YEAR

$4 each

Bind your copies for QUICK reference in this handsome, durable binder. Each magazine easily inserted.

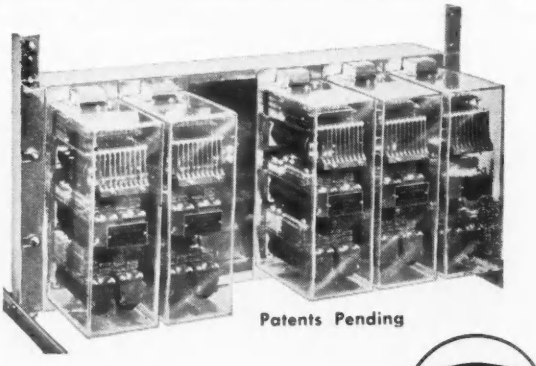
TELEPHONE ENGINEER PUBLISHING Co.
7720 Sheridan Road,
Chicago 26, Illinois ....., 1957

Gentlemen: I am enclosing $ covering
binders @ $4.00 each postpaid

Name .....

Company .....

Address .....



Patents Pending

INDEPENDENT

- **CODE-TO-SELECTIVE CONVERTERS**

Provides 10-party selective ringing. Use with present equipment.

Ask for Bulletin No. 554

- **DIGIT ABSORBERS**

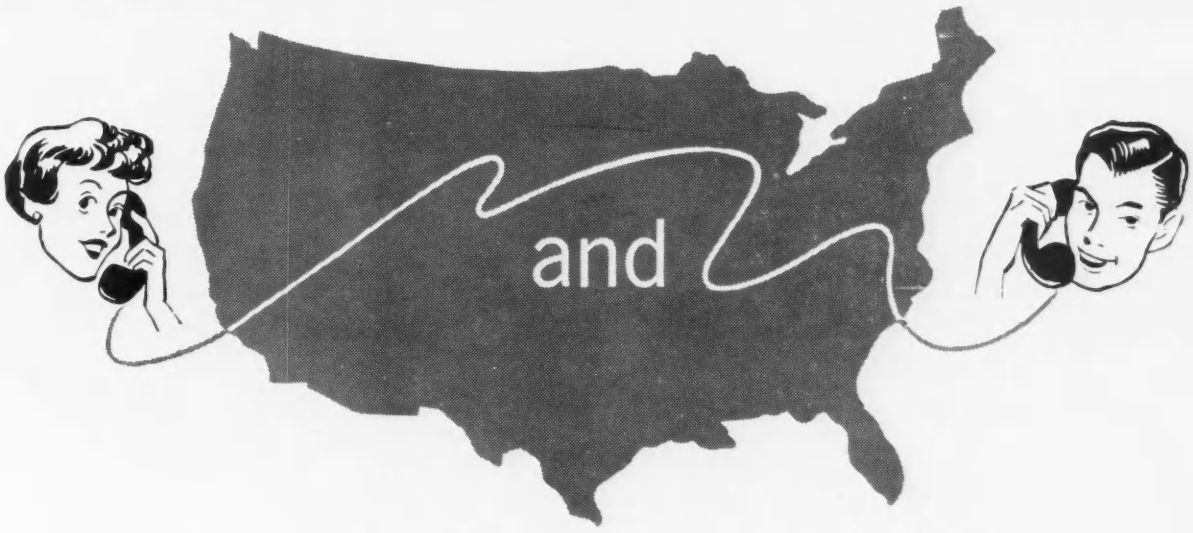
For converting switchboards into full 2-5 numbering.

Ask for Bulletin No. 555

UNIVERSAL CONTROLS CORPORATION

P. O. Box #13122, Walnut Hill Sta., DALLAS 20, TEXAS

The independent company



direct distance dialing

By L. A. HODSON

In Part VI of his article on Direct Distance Dialing, Mr. Hodson discusses the general toll switching plan. Part V of this article appeared in the February 1, 1957 issue. Part VII is scheduled for the June issue of "TE&M."

The General Toll Switching Plan

IN ORDER to organize the routing of calls in the most efficient manner possible all central offices have been assigned to five classes as shown in *Fig.* 1 and all routes between them have been classified as high usage or final routes. The lowest class of office, class 5, is that on which the subscriber's telephone is terminated. A class 5 office may be located in the same building as a higher class of office and both local and toll switching functions may be performed by the same equipment, but for the purposes of considering the toll switching plan all subscriber's lines are considered to terminate in class 5 offices.

A number of class 5 offices may be served by, or "home" on, a class 4 office. This may be a toll center (class 4C) in which operators would be present to handle both inward and outward toll calls if necessary, or it may be a toll point (class 4P) in which operators would not be present to handle inward traffic. They may or may not be present to handle outward traffic which cannot be dialed by subscribers.

A number of class 4 offices may home on a class 3 office; a number of class 3 offices may home on a class 2 office and a number of class 2 offices may home on a class 1 office. An office may home on an office of any higher category, that is, a class 5 office may home on an office which may be in class 1, 2, 3 or 4; a class 4 office may home on an office which may be in class 1, 2 or 3 and so on. A single, final, route is provided between each office and the higher ranking office on which it homes. There is thus a basic network of final routes formed by a series of final route chains which terminate at the top in the regional centers. All regional centers in the United States are connected together by final routes.

Looked at from a geographical point of view it can be seen that this concept results in the division of the country into regions, of which there are at present nine, which are served by Regional Centers. Each Region is subdivided into Sections, served by Sectional Centers. Each Sectional Center in a Region homes on the Regional Center. Each Section is further subdivided into Primary Areas, served by Primary Centers. Each Primary Center in a Section homes on the Sectional Center. The Primary Areas are subdivided into Toll Center or Toll Point areas. Each Toll Center or toll Point in the Primary Area homes on the Primary Center.

In addition to this basic network of final routes, high usage routes may be provided between offices of any class, where the volume of traffic justifies the cost of providing them.

Automatic Alternative Routing

IN THE MANUAL toll switching plan and in the early operator toll dialing arrangements, in which alternative routing was not highly organized and was limited in scope, the number of circuits to be provided in a group between two offices was determined by the grade of service to be given. This grade of service is expressed as "so many lost calls per hundred calls attempted" or as a delay in making the connection. The traffic considered in establishing this standard is that offered in the average busy hour in the busy season. This arrangement could be very un-

DID YOU EVER

see 3 nicer PABX installations?

They're by the Middle States Telephone Company of Illinois

The equipment is by LEICH

Park Ridge and Des Plaines are two of Chicago's "growingest" suburbs. The many business firms moving to these towns provide great telephone revenue opportunities for the Middle States Telephone Company which serves these two towns.

Middle States chose the Leich Dial System as the most practical and efficient way to furnish modern PABX service to these new business customers shown here.

WHY LEICH?

The Leich Dial System with its all-relay operation is ideal for PABX installations. It requires very little maintenance, takes a minimum of space, operates quietly and efficiently for long periods without any attention.

With the Leich Dial System your PABX customers can have their choice of every desirable service feature. There's ample capacity for main exchange, foreign, information and tie trunks.

Attractive floor type or keyset attendant's cabinets can be furnished to customers specifications.

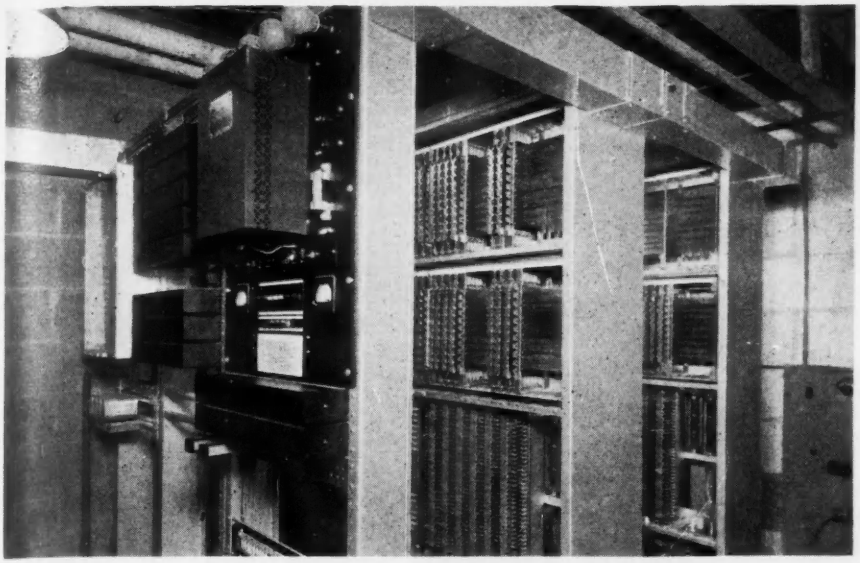
From the telephone company's standpoint, this is a practical investment. For with the Leich Dial System you can quickly and inexpensively add lines or links by jacking them in on the switchboard.

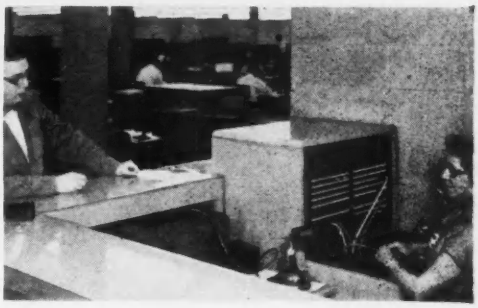
If there are any PABX prospects in your territory, we shall be glad to quote you on a Leich Dial System PABX.

There's no charge or obligation. Let's hear from you.

LEICH

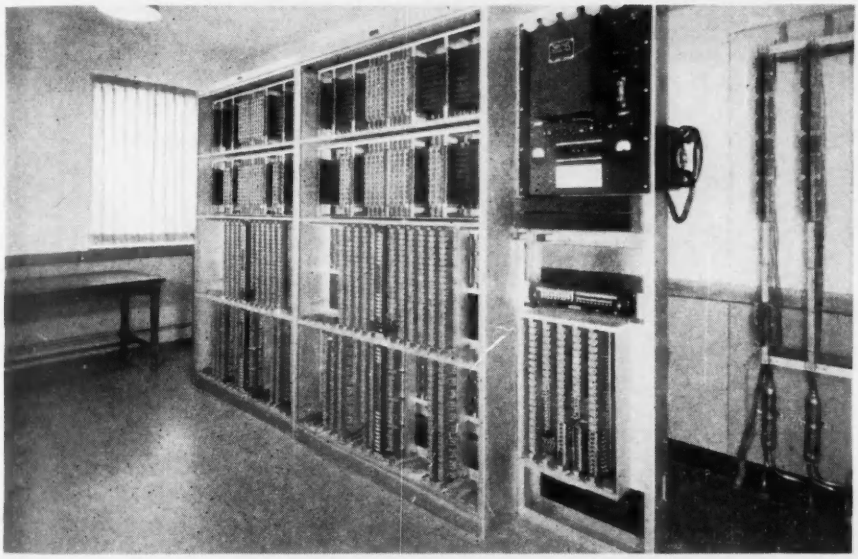
LEICH SALES CORPORATION, 427 WEST RANDOLPH STREET, CHICAGO 6, ILLINO





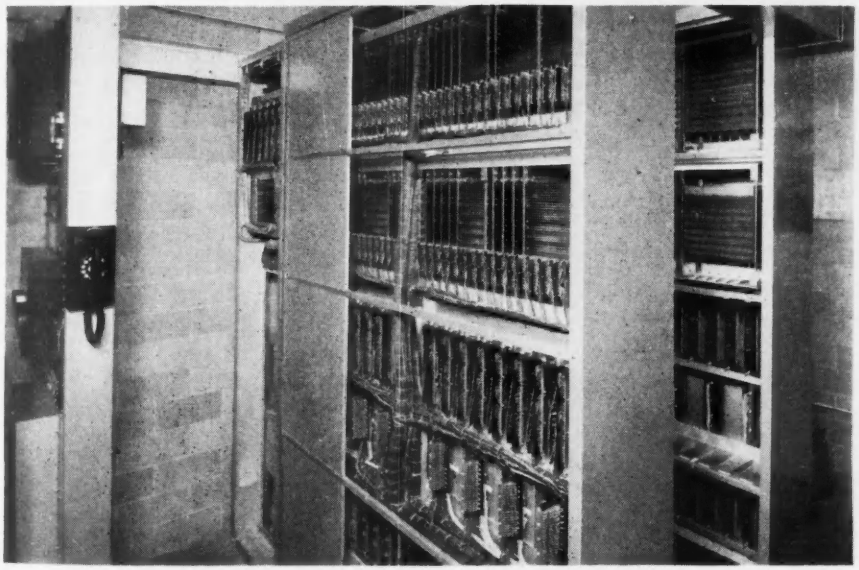
BUTLER BROTHERS

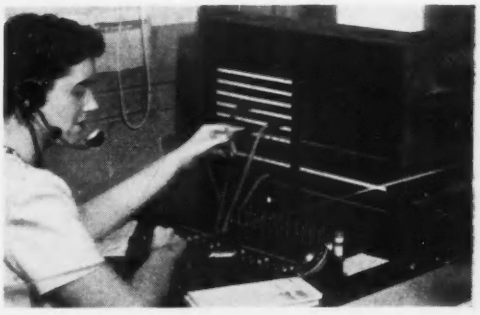
140 lines, 18 trunks, 16 links, single position attendant's switchboard. The Leich Dial System is wired for 200 lines.



GENERAL MILLS

100 lines, 24 trunks, 16 links, two position attendant's switchboard. Wired for 200 lines.





FASTEX DIVISION
ILLINOIS TOOL WORKS

100 lines, 14 trunks, 10 links, single position attendant's switchboard. Wired for 200 lines.

manufacturers of telephones, switchboards and related apparatus since 1907

PACIFIC COAST: 11401 WEST PICO BLVD., LOS ANGELES 64, CALIFORNIA SOUTHWEST: 1227 SLOCUM STREET, DALLAS 7, TEXAS

economical, as shown in Fig. 2. This figure plots the traffic offered to the group against time, over a 24 hour period. The traffic is measured in traffic units, or T.U.'s. A traffic unit is a measure of circuit occupancy in hours, so that 1 TU is equal to one hour of circuit occupancy. Ten circuits fully occupied for one hour carry 10 TU's of traffic, and so on.

It can be seen from *Fig.* 2 that even during the peak traffic period, or busy hour, the ten circuits in the group can only carry 4.93 TU's of traffic if the specified grade of service of 3 lost calls in 100 is to be maintained. That is, during its period of maximum utilization, the group is only operating at 49.3% efficiency. The traffic which cannot be carried by the group during the busy hour is lost. During the 24 hour period the total circuit occupancy time is 43.80 hours, out of a total of 240 circuit hours available. Over a 24 hour period the efficiency of the group is thus only 18.4 per cent.

It is obvious that if this percentage usage could be improved, considerable savings could be effected in the cost of providing the large number of toll circuits necessary to implement the nationwide toll dialing plan. To meet this need a facility known as automatic alternative routing is incorporated in the general toll switching plan. Associated with the principle of automatic alternative routing is the concept of high usage and final routes.

The scheme can perhaps best be illustrated by an example. Take the case of a call from E01 in *Fig.* 1 to E02. E01 has only a single toll outlet, the final route to TC1, on which it homes. The call is therefore passed for connection to TC1. The toll switching equipment in TC1 first attempts to connect the call over the high usage group to TC2. If all circuits in the group are busy it will connect the call over the final route to PC1. The toll switching equipment in PC1 first tries to connect the call over the high usage group to TC2. If all circuits in the group are busy it will next try the high usage group to SC2, and so on. If you wish to trace them out, the alternative routes available to a call from EO1 to EO2, in order of choice, are shown in *Table One.*

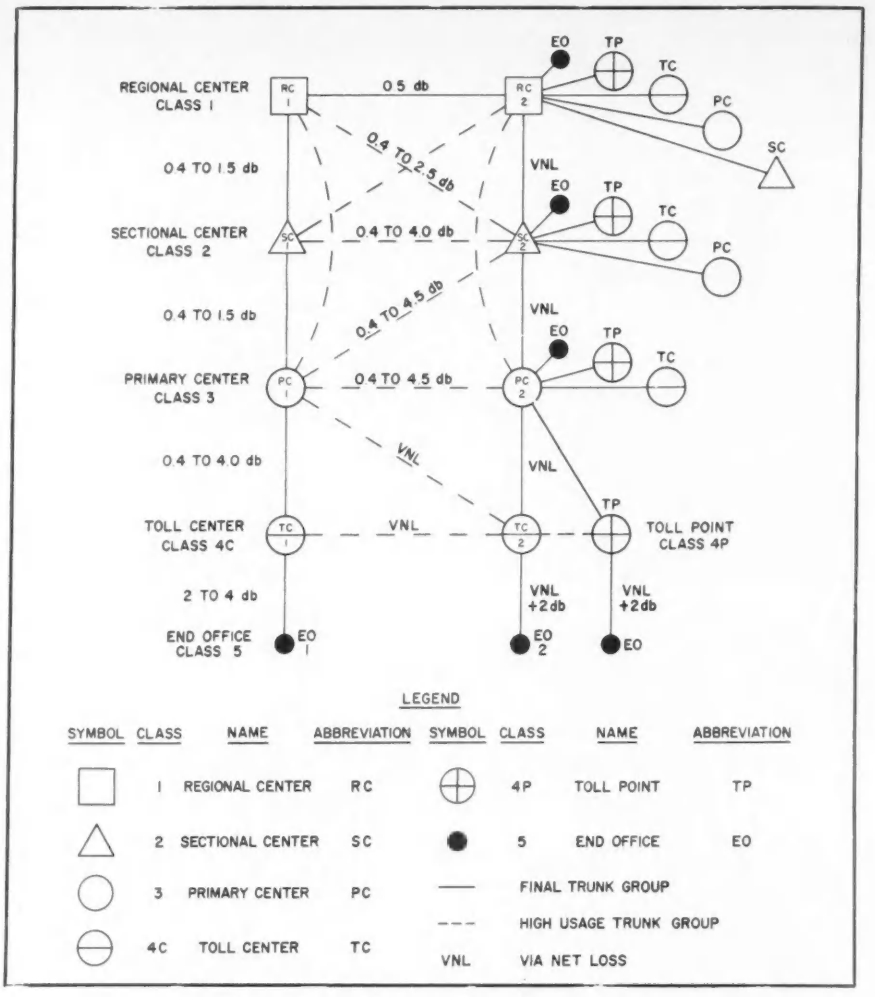


FIG. ONE:—General toll switching plan.

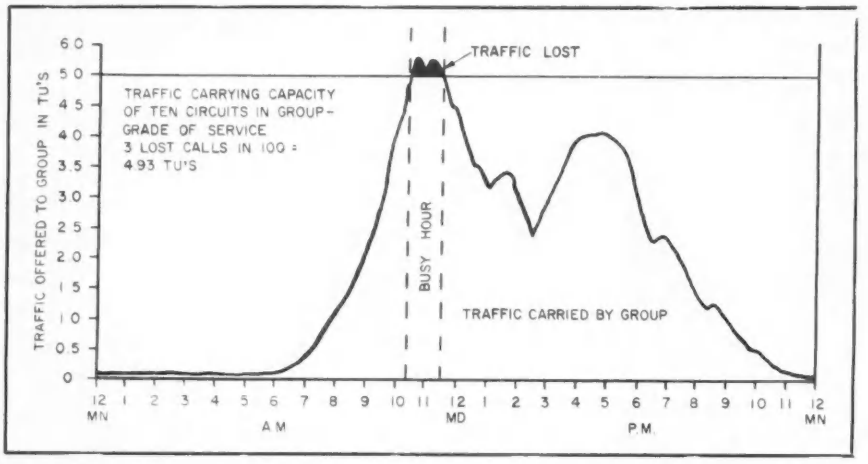

TRAFFIC OFFERED TO GROUP IN TU'S
TRAFFIC CARRYING CAPACITY OF TEN CIRCUITS IN GROUP - GRADE OF SERVICE 3 LOST CALLS IN 100 = 4.93 TU'S
TRAFFIC LOST
BUSY HOUR
TRAFFIC CARRIED BY GROUP
12 MN
A.M.
MD
P.M.
MN

FIG. TWO:—Typical incidence of traffic on typical group of 10 toll trunks during a 24 hour period.

It will be seen that the final choice route uses the full final route chain. The routing principles which emerge from this are:—

(1) A call may move up its own final route chain as far as necessary.

(2) Once it has crossed to another final route chain it can only go downwards.

(3) Once it has crossed to another final route chain it cannot cross to a third final route chain.

From this it follows that no routing pattern can have three offices in the same class in sequence, that is, routings of the following patterns are not permitted: —

EO - EO - EO
EO - TC - TC - TC - EO
EO - TC - PC - PC - PC - TC - EO
EO - TC - PC - SC - SC - SC - PC - TC - EO

There is an exception in that RC - RC - RC routings are sometimes required to complete calls to Canada and a special case in that a call is

Choice Number	Route
1	EO1 - TC1 - TC2 - EO2
2	EO1 - TC1 - PC1 - TC2 - EO2
3	EO1 - TC1 - PC1 - PC2 - TC2 - EO2
4	EO1 - TC1 - PC1 - SC2 - PC2 - TC2 - EO2
5	EO1 - TC1 - PC1 - RC1 - SC2 - PC2 - TC2 - EO2
6	EO1 - TC1 - PC1 - RC1 - RC2 - PC2 - TC2 - EO2
7	EO1 - TC1 - PC1 - RC1 - RC2 - SC2 - PC2 - TC2 - EO2
8	EO1 - TC1 - PC1 - SC1 - SC2 - PC2 - TC2 - EO2
9	EO1 - TC1 - PC1 - SC1 - RC2 - PC2 - TC2 - EO2
10	EO1 - TC1 - PC1 - SC1 - RC2 - SC2 - PC2 - TC2 - EO2
11	EO1 - TC1 - PC1 - SC1 - RC1 - SC2 - PC2 - TC2 - EO2
12	EO1 - TC1 - PC1 - SC1 - RC1 - RC2 - PC2 - TC2 - EO2
13	EO1 - TC1 - PC1 - SC1 - RC1 - RC2 - SC2 - PC2 - TC2 - EO2

TABLE ONE.

never routed through one end office to reach another end office, such as a routing TC - EO - EO. These rules are necessary both to ensure that transmission losses will never be such as to give bad service, and to ensure that a call will never be routed in circles around the country so that it ties up an excessive amount of toll plant.

As, at each switching point, alternative routes are available to a call it is obvious that a high grade of service need only be provided on the final route, to which there is no alternative. The first choice, high usage, routes can be provided on a basis which will give the maximum economic utilization of the circuits in them, as the traffic which cannot be carried on them will not be lost, but will overflow into the final route. The actual division of the traffic between the high usage routes and the final route is determined by the comparative costs of additional circuits in in the high usage and final routes. A detailed exposition of the principles and methods involved is given in an article "Traffic Engineering Techniques for Determining Trunk Requirements in Alternate Routing Trunk Networks" by C. J. Truitt in the *Bell System Technical Journal* for March 1954.

An example of the results obtained is given in *Fig.* 3. This shows the same traffic as in Fig. 2, but the number of circuits in the group has been reduced to seven, it being assumed that this is the most economical size for this high usage route, and automatic alternative routing has been provided over a final route.

It can be seen that quite large amounts of traffic overflow, over an extended period. The result is that during the busy hour this group of circuits operates at 62.1 per cent efficiency, compared with 49.3 per cent, and during the 24 hour period the group operates with 24.2 per cent ciency, compared with 18.4 per cent, cent.

Furthermore the grade of service to the subscribers is appreciably improved because whereas in the situation illustrated in *Fig.* 2, all the traffic in the busy hour was subject to a grade of service of three lost calls in 100, in the situation shown in *Fig.* 3 only the traffic colored black is subject to that grade of service. A further advantage is gained in that the peaks and valleys of the traffic on the high usage routes and of the traffic which initially belongs on the final route will probably not coincide, so that the peaks from one route will fall into the valleys of another, thus both improving the service and improving the operating efficiency of the final route. If the system has been well designed the incidence of traffic to the final route should show a comparatively flat characteristic over an appreciable period, longer than the normal concept of a "busy hour."

Limited Transmission Losses

IT HAS BEEN shown that under the general toll switching plan a typical call from one end office to another end office may be routed any one of thirteen different ways. Some calls may have access to less than this number of alternative routes; some calls may have access to more than 13 alternative routes. It can also be seen that the number of separate links in a connection may vary between one and nine (ten in the case of some calls to Canada).

The number of separate links employed for a given call at any time is purely a matter of chance. In order to prevent subscribers noticing appreciable differences in transmission quality between calls between the same places, made at different times, it is essential that, regardless of the routing, the transmission quality be always satisfactory.

This requirement could be met by an ideal transmission arrangement in which every circuit would be operated at zero loss. In practice, however, echo and singing problems which are conditioned by the lengths of the circuits and the velocities of propagation of the media used to provide the circuits, prevent the attainment of this ideal. The best practicable arrangement is to operate each circuit at the lowest possible transmission loss allowed by the length of the circuit and the type of facility used to provide it.

There are two types of circuits to be considered:

(1) Intertoll trunks — which include the final trunks between a class 4, or higher, office and the office on which it homes, and the high usage trunks between a class 4, or higher office and other class

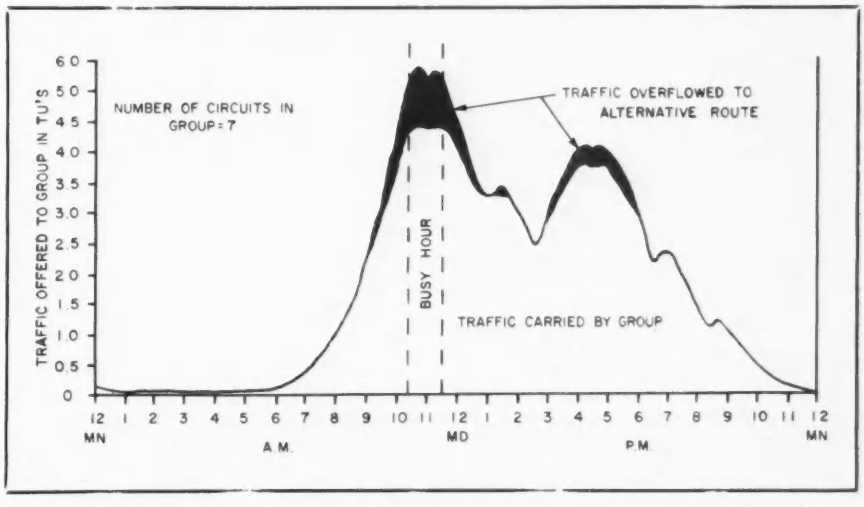


FIG. THREE:—Disposition of traffic offered to a high usage group of 7 circuits, with automatic alternative routing.

4 or higher offices.

(2) Toll Connecting trunks — between a class 5 office and the class 4 or higher office on which it homes.

Intertoll trunks are operated at their Via Net Loss, which is the lowest practiable loss at which the circuit can be operated without causing unpleasant echo, crosstalk or singing. To facilitate the calculation of the VNL for a particular circuit Via Net Loss Factors have been established by relating the transmission characteristics of different types of circuits to the results of a statistical analysis of the tolerance of subscribers to echo. (*See Table Two.*)

The calculation of the operating loss of intertoll trunks is complicated by the need to consider factors, such as office balance and the average return loss of the intertoll trunks connected to the office, which, because of lack of trained personnel, suitable testing equipment, and basic information, are normally beyond the scope of the smaller independent companies. The advice of the local Bell System Company should, therefore, be sought as to the measures to be taken to bring intertoll trunks up to standards required by nationwide toll dialing.

Toll connecting trunks are operated at Via Net Loss plus 2 db to a permissible maximum loss of 4 db. Where the actual loss is very small, as in the case of internal trunks between a class 4 office and a class 5 office in the same buildnig, 2 db pads are inserted in the toll connecting trunks. Where the class 5 office is remote, the calculation is as described for intertoll trunks. For example, in the case of a 50 mile open wire voice frequency circuit, including one mile of entrance cable:

Via Net Loss = 50 x .01 =	.5 db
Add 0.4 allowance =	.4 db
Add 2 db =	2.0 db.
Total =	2.9 db
Actual Loss =	
49 miles x .075 db/mile =	3.8 db
1 mile x 1.2 db/mile =	1.2 db
2 coils x .5 db =	1.0 db
Total =	6.0 db
Repeater gain required =	
6.0 db — 2.9 db = 3.1 db.	

The VNL plus 2 db design for toll connecting trunks will normally be sufficiently stable to make the use of idle line terminations unnecessary. If a trunk is found to be unstable when operated at the VNL plus 2 db loss, is is indicative that there is some structural irregularity in the circuit, perhaps in the loading spaceing, or in the transposition, which should be corrected.

Facility	VNLF (DB Per Mile) 2 Wire Facility	4 Wire Facility
19H88 - 50 side	.03	.014
19H88 - 50 phantom	.03	.014
19B88 - 50 side	.04	.....
19B88 - 50 phantom	.04	.....
19H44 - 25 side	....	.01
19H44 - 25 phantom	....	.01
Open wire voice frequency	.01	....
Open wire carrier (all types)	....	.0017
Type K or N carrier	....	.0019
Type L carrier	....	.0015
Carrier circuits on radio	....	.0014
H88 on paired exchange type Cables — any guage	.04	.....

To calculate the VNL for any trunk it is necessary only to multiply its VNLF by its length, and add 0.4 db to allow for expected variations from the assigned net losses. Subtracting this figure from the actual loss of the circuit gives the repeater gain required.

TABLE TWO:—Via net loss factors for typical telephone facilities.

The national toll dialing switching plan allows up to nine links between end offices. It can be seen that excessive variations from the assigned losses on individual circuits may cause large positive or negative losses to accumulate in multi-switched connections, causing low volume or excessive echo.

On many connections, an operator will not be present to observe the quality of transmission, and with customer dailing and automatic alternate routing it will be practically impossible to identify a faulty circuit. The transmission plan has been designed on the assumption that the variation from the assigned loss, VNL or VNL plus 2 db, on any circuit will be strictly limited. Careful maintenance will be necessary to meet this requirement.

To operate the toll system successfully, it will be necessary to have well trained personnel, adequate test equipment and an appreciation that trouble can only be cleared successfully by eliminating the basic cause, not by making terminal gain adjustments to remove the symptoms.

The applicability of the transmission standards and the ranges within which the losses on each type of circuit are expected to fall are shown in Fig. 1. There are exceptions to this objective pattern in that in the early stages, before carrier facilities are available on all routes, TC — CSP routes (high usage and final) and TC — TC high usage routes may be operated at VNL + 2 db. — *To be Continued.*

Book Review

"*Sales Forecasting: Uses, Techniques, and Trends.*" Published by the American Management Association, 1515 Broadway, Times Square, (Dept. TE&M), New York 36, N. Y. Special Report 16. 159 pages. Price: $3.75.

Accurate sales forecasting helps to assure future marketing success. By identifying and anticipating customer needs and demands, a practical sales-forecasting program can serve as the springboard for the company's financial, production and purchasing plans.

In this new AMA Special Report, specialists discuss in detail such aspects of the forecasting function as: forecasting for new products (*General Electric Company*); finding and evaluating basic data (*The Upjohn Company*); using new mathematical techniques in forecasting (*Westinghouse Electric Corporation*); reviewing and revising forecasts in the light of new information (*The Firestone Tire & Rubber Company*); and using sales forecasts in other departments (*Aluminum Company of Canada, Ltd.*). Actual company experience in sales forecasting is described by representatives of *Corning Glass Works, Dodge Manufacturing Corporation.*

How Are Your

Telephone Manners?

By PHIL GLANZER

"WHEN YOU do business by telephone the person on the other end of the line judges *you* by what *you say* and how *you say it.* This article tells how you can *win friends* by using the telephone correctly."

DEEP BREATHING and vocal exercises can give anyone a radio announcers' clear, distinct speech, according to a Bell Telephone of Canada booklet. MARY MEGIN (left) and BERNICE BROCKLEHURST improve their office telephone technique with voice gymnastics. Want to try it? Say—"*lope, nope, leer and beer*"—It wakes up lazy lips and jaws.

EVERY time you answer or handle a telephone call, you can win or lose a friend for yourself or business for your firm.

That reminder, provided by the Bell Telephone Co. of Canada, holds true for all people who use the telephone.

The importance of remembering it is growing daily, because people in North America are the world's leading telephone conversationalists and telephone use is steadily increasing.

When you do business by telephone the person on the other end of the line judges everything about you by what you say and how you say it. That's why it has been said that "when we speak, we speak twice." Our words can say one thing, and our voice another. Often a speaker's tone imparts more than his words.

If you could call yourself on the telephone what would you hear? Simply your voice and speech — your sole representatives. You would hear yourself as others hear you.

What would be the answers to some of the questions you might ask yourself . . . . "Is my voice pleasing?" . . . . "Is there a warmth about my greeting when I answer the telephone?" . . . . "Does my voice convey the impression of a helpful, alert person?"

If you suspect that the answers to those questions might not be as favorable as you would want them to be, here are a few of the things to remember which should help you get the most out of telephone conversations.

(1) *You can improve the clarity of your speech merely by speaking directly into the mouthpiece.* The reason for this is that the telephone transmitter is designed to eliminate all room noises and pick up only sound uttered directly in front of it. When the lips are less than a quarter of an inch from the mouthpiece you get the best results.

(2) *Speak to the person, not at the telephone.* Use the caller's name whenever you can, and picture him clearly in your mind — try to gain the illusion that you are talking face-to-face.

(3) *In all conversations, try to get the caller's viewpoint.* Don't interrupt, argue, or become impatient. Avoid making him repeat because of inattention on your part.

(4) *When the telephone bell rings and you are ready to answer, always remember that your first words are important.* You don't know who is calling, but it may be one of your company's best customers . . . . or a prospective customer making inquiries . . . . or may be even the boss with that long-awaited raise.

(5) *Avoid such indefinite and time-wasting expressions as "Hello" and "Yes."* It is much better to identify yourself by announcing your name or the name of your department, depending on which you think will be most helpful to the caller.

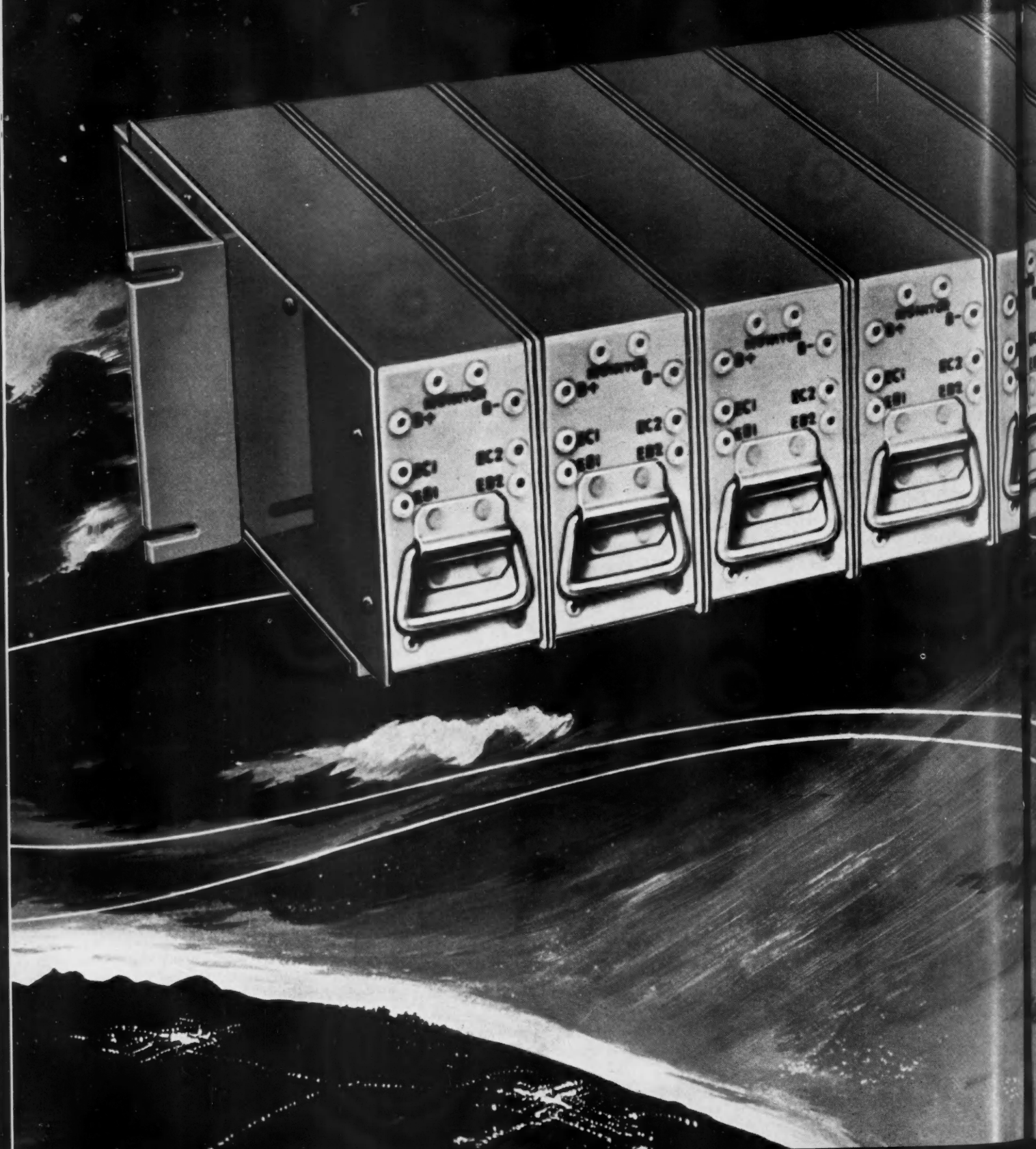
For example, you might say "*Brown here*" or "*Brown speaking*" — "*Accounting department, Brown speaking.*" Your own identification made, the person calling will probably respond by identifying himself.

(6) *If you are answering another person's telephone, give that person's name.* Examples might be — "*Mr. Smith's office*" . . . . "*Policyholders' service department, Mr. Smith's telephone*" . . . . "*Mr. Smith's office, Miss Jones speaking.*"

(7) *When you answer another person's telephone, try to find out who is calling, if he does not identify himself.*

The best way to do this without appearing inquisitive, and to make

The features that make Voice Repeaters s
are all in this new Stromberg-Carlson p



ers superior

on product...

✶ TRANSISTORIZING

✶ PRINTED WIRING

✶ SHELF SPACE ECONOMY

✶ AVAILABILITY IN BOTH SERIES AND SHUNT TYPES

You'll find, in our new "541" negative impedance voice repeaters, many factors you have wanted, but found missing, in products already on the market.

We have spent many man-hours developing new repeater techniques to meet your requirements, and have created a repeater with all the features demanded in a modern, trouble-free unit.

THESE FEATURES ARE IMPORTANT TO YOU:

- **Our "541" is transistorized**
  Trouble inherent in vacuum tubes eliminated... years of service without replacement.
- **Our "541" uses printed wiring**
  This modern manufacturing technique provides absolute uniformity and trouble-free wiring.
- **Our over-all size is minimum**
  Thanks to transistorizing and the miniaturizing of components, you can install up to 200 repeaters on a single standard 9-foot rack. Each repeater measures only 3½ x 2 x 9½ inches.
- **We offer a complete line**
  The "541" voice repeater is available either in series type or shunt type.
- **Outside plant economy**
  With the "541," the need for expensive cable loading is reduced. And you can use smaller-gauge cable to meet tomorrow's transmission standards.
- **Low power drain**
  Only 1.6 watt per repeater unit from your existing 48-volt battery.

Ask your nearest Stromberg-Carlson representative to show you this latest example of modern design and precise manufacture. Literature on request.

S-C STROMBERG-CARLSON

STROMBERG-CARLSON COMPANY

A DIVISION OF GENERAL DYNAMICS CORPORATION

Sales Offices: Atlanta 6, Chicago 6, Kansas City 8, Rochester 3, San Francisco

GD GENERAL DYNAMICS

it clear that the information is for the other person, is to ask a question like: *"May I tell him who is calling, please?" . . . . "May I take a message for him, please?" . . . . "Would you like to have him call you?"*

Don't Annoy The Caller

IN AN organization where there are many departments, it is well to keep in mind that being transferred from one telephone to another may be annoying to a caller. No one likes to be obliged to repeat what he has to say to several people. Therefore, if you can attend to a call satisfactorily yourself, do so.

If, however, you can't take care of the call, you may offer to refer the matter to the proper person, naming him if possible. In some cases, you will want to indicate that the person calling will be called back. In other cases this won't be necessary. For example — "This is something Mr. Brown of the accounting department looks after. I'll tell him about it, and I'm sure he will give it prompt attention."

If you know where the matter should be referred, and that someone will be there to handle it, it may be advisable to transfer the call. An example of this — *"That matter would be handled by our accounting department. If you wish, I'll have you connected with them."*

When you are to be away from your telephone, it's a good plan to leave word where you are going — how you can be reached — giving the extension number, if available — and when you will return.

Whenever possible, have a pencil and memo or order pad at hand when you answer a call; then you will not have to leave the telephone and keep the other person waiting.

Telephone Etiquette

HERE are some further tips on telephone etiquette. When it is really necessary to interrupt, first ask permission of the other person and explain what you are doing, or going to do. For instance — "Will you hold the line, please, while I find out about that?"

On returning to the telephone, if there has been some delay, thank the other person for waiting. It's as simple as this — *"Thank you for waiting, Mr. Smith," or "I am sorry to have kept you waiting, Mr. Smith."*

If you require a little more time to obtain your information, offer to call the other person back later. You might say — *"I'm sorry, but it will take a little time to get that information. If you wish, I'll call you back as soon as I have it."*

Up to now, you have been the person receiving a telephone call. To get the other viewpoint, let's reverse the situation — you are the one calling and presenting yourself to the other person. The underlying ideas are the same. You want to make a good impression and receive a welcoming answer.

Self-introduction is an important matter — from your point of view anyway. As you are the caller, you are in the position of wanting something — either service or a hearing for whatever you may desire to promote or sell. In either case, your cause will be aided by genuine, well-expressed courtesy.

If the person you are calling answers and identifies himself, promptly announce your name and, if desirable, the firm's name: *"This is Jones, of Allied Distributors."*

When you leave word for someone to call you, leave both your name and telephone number. Be sure the person with whom you leave the message gets it correctly.

When you have finished a telephone call and said *"Goodbye" or "Thank you,"* replace the receiver carefully on the telephone cradle. Slamming down the receiver can be likened to slamming the door.

We are not born with a voice. We are born with the ability to expel air from the lungs and as we contract our vocal chords and as the air passes through them a sound wave or tone is set up. The tone passes through the throat over the base of the tongue and out between the teeth and the lips. Movement of the tongue, the teeth, and the lips, molds or "mouths" that sound into broken sections which we call words.

Two of the most common faults of speech are: (1) Talking without sufficient air in the lungs, and (2) lack of mouth energy which has been called lip laziness, or tongue laziness. Most people can make immediate improvements in their speech by merely using more energy.

Following are seven fundamentals of good speech:—

(1) For distinct enunciation, every word, every syllable, every sound, must be given proper form and value.

(2) Think of the mouth chamber as a mold in which the correct form must be given to every sound.

(3) The teeth should never be kept closed in speech.

(4) You may know what you are saying, but others will not, unless you make it clear to them — so talk distinctly and not too fast.

(5) The courtesy of face-to-face conversation, where the smile plays such an important part, can be expressed over the telephone only through the tone of voice and a careful choice of words.

(6) As your voice is the direct expression of your innermost self, you should be careful through it to do yourself justice.

(7) Good speech is within the reach of everyone through diligent practice.—*Phil Glanzer.*

"Transistor Manual"

THE GENERAL ELECTRIC CO. has announced publication of a booklet entitled "Transistor Manual" containing basic information on transistors and their operation in circuits. The booklet is designed to assist the service technician, hobbyist, and design engineer in working with transistors.

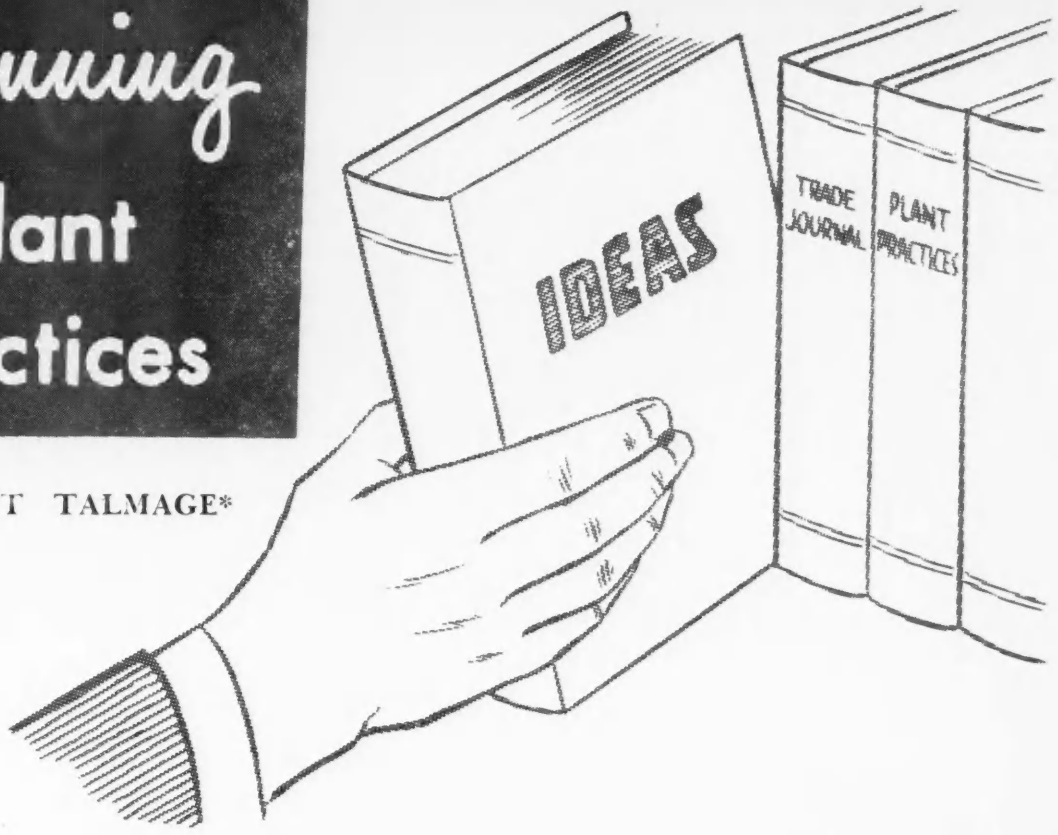
The General Electric "Transistor Manual" includes information on basic semiconductor theory, construction techniques used to make the various types of transistors now on the market, basic principles of transistor circuit design, and specifications, with outline drawings, of all transistors registered with the Radio-Electronic-Television Manufacturers Association.

In addition the booklet also contains complete explanations of transistor parameter symbols now in common use.

Nineteen circuit diagrams ranging in complexity from a one-transistor, simple, audio-amplifier to a six-transistor, superheterodyne broadcast receiver are included with complete parts list for the hobbyist and experimenter.

The new G-E booklet is priced at fifty cents. It may be obtained by writing to the Semiconductor Products Department, General Electric Company, Dept. TE&M, Syracuse, N. Y., or from local General Electric tube and transistor distributors.

Planning plant practices



By T. DEWITT TALMAGE*

A Job Well-Planned is Half Done; A Job Poorly-Planned is Never Done. — Using Facts in Place of Intuition Gets Better Results. — The Man Who Knows *How* Will Always Have a Job; But the Man Who Knows *Why* Will be His Boss. — This Article Describes a Still More Valuable Worker.

FEW ENTERPRISING individuals will take issue with the wisdom expressed in the maxim: it is good business to look ahead. This is because experience has shown that generally the advantages gained by so doing outweigh the disadvantages.

However, it can be appreciated that in particular instances, honest differences in opinion may arise regarding timing or details of procedure to use in studying present and future trends, interpreting the data, and developing a business-like plan to guide company operations. The solution to these situations, however, is usually limited to matching of procedural methods to the problems at hand.

The thing that must be guarded against is not to let complacency cloud one's foresight.

From a practical standpoint it is usually the *value* of the net benefit that controls the amount of effort and money that can justifiably be spent on the work involved in extending the usual day-to-day planning further into future periods, usually measured in years.

**Educational Manager, Kellogg Switchboard & Supply Co., Chicago 38, Ill.*

Survey Starting Point

BEFORE ANY worthwhile future plans can be charted, it is first necessary to find a starting point. We must, therefore, take stock of our present situation and determine where we are from the standpoint of adequacy and condition of plant facilities, size and character of area dependent upon us for telephone service, financial position and potential, and that important but sometimes overlooked asset: loyal and qualified manpower — its present availability or its future source. Some current aspects of this last subject will be discussed hereinafter.

One of the objectives of most surveys is to measure the state of health of the business and generally includes an evaluation of the scope and grade of services being supplied by the company. Upon completion of this phase, the next step, if the business is ailing, is to seek out ways to improve it; to revitalize the company if it is stagnated; to establish a remedial course of action if it is drifting aimlessly; or to make a healthy business still more vigorous.

Thus, regardless of a company's present status, good

use can be made of the results of an impartial survey even if it is only to reassure all concerned that a satisfactory job is being done. While the outcome of all surveys does not indicate a need for major changes, it is indeed a rare instance that the situation is found so good that it cannot with profit be improved.

Are such surveys being made?

Yes, there are many fundamental studies of this sort being made in both the Bell System and the Independent telephone fields. The larger companies, of course, have long made use of so-called master plans which are constantly studied and kept up-to-date by staff experts and are regularly reviewed by the management group. Smaller companies also have plans for the future but in some cases they are less formally organized.

Bankers and other sources of telephone construction loan funds very often like to see the plan on paper with suitable exhibits which assist in supporting the practicality of the proposed construction, rehabilitation and modernization work.

There are a number of such financing programs available today to worthy telephone company borrowers, one of which alone includes over 500 projects in about 1,500 Independent telephone exchange areas in 43 states and Alaska.

On this basis, the "average" size company participating in this one rural telephone service modernization program includes three dial central offices, each one of which will serve 500 dial telephones and require the construction of 142 miles of new line.

THE CANDID Polaroid camera caught WILLIAM K. MILLER, manager, Valley Telephone Co-operative Association, Inc., Herreid, S. D., in a relaxed mood reviewing "Basic Electricity," written and illustrated by Van Valkenburgh, Nooger and Neville, Inc. Use of this popular textbook was recommended to telephone plant employes in the October, 1956, issue of *Telephone Engineer and Management*.

As might be expected, all long-range business studies do not indicate the same size pot of gold at the end of the rainbow. In fact, some vistas of the future may bring into focus certain troublesome facets which, if they cannot be avoided, must at least be handled judiciously if the solvency of the enterprise is to be maintained. Vital indications of such a basic consideration should in themselves be sufficient justification to look into the entire matter because it is just as important to know what *not* to do as to realize what should be done.

Benefits Of Planning

THE TELEPHONE industry can attribute a considerable part of its present-day size and success to long-range planning. True, the apparent necessity for the exact kind and degree of thoroughness of this planning seems to have varied between localities over the years. But the overall result of this forward planning has been to hold down plant investment to a point lower than would otherwise have been the case. The results have been beneficial to all concerned because rate bases have been kept at reasonable levels and the quality, convenience, and scope of telephone service have steadily improved.

Interested companies desiring information on the general plan and the sequence of detailed steps in a survey of growth potential and other factors influencing telephone business stability and success may secure advice from many sources including their state or national telephone association,[1] favorite telephone manufacturer and supplier, or neighboring company which has had successful experience in making a study and applying it throughout its own service territory.

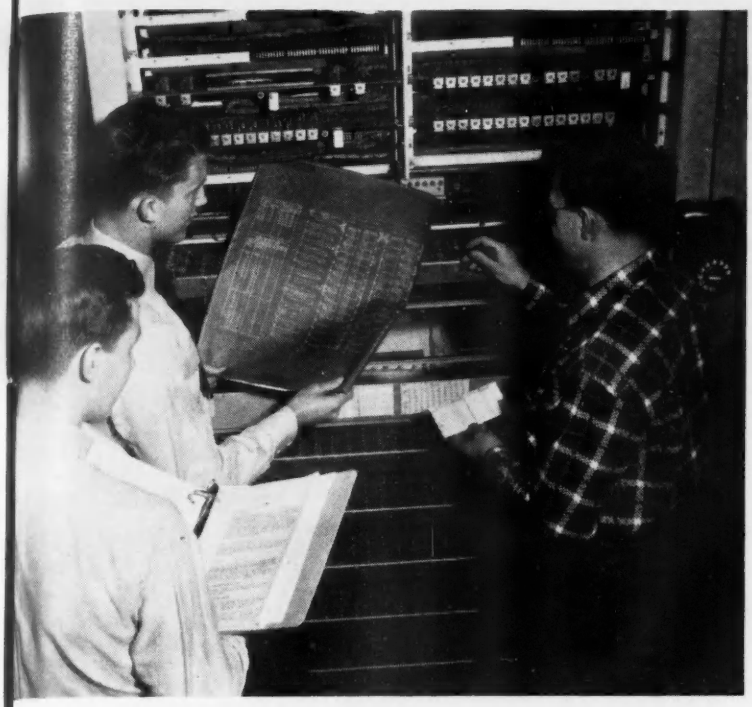
Methods of planning, estimating, and constructing the physical facilities of a modern telephone system are generally understood. Consequently, a fairly standardized pattern has evolved which, with such variations as local conditions dictate, has been found to be economically, technically, and operationally acceptable. If desired, the services of experienced consulting engineers and construction contractors are available to handle this part of implementing the program.

Basic Maintenance Goal

ON THE OTHER HAND, the problem of keeping fundamentally good, that is, properly-engineered and well-constructed, telephone systems operating *satisfactorily* over the years at a *reasonable cost* is less standardized. As a result, this phase of the job is seemingly a more demanding task as many will testify who have conscientiously tried to do it.

A railroad, according to the philosophy among railroaders, is 95 percent men and 5 percent iron. What is true of railroading in this sense is true of most businesses including the telephone business. Much of the

[1] "*Small Office Dial Conversion.*" *A Study Prepared by the United States Independent Telephone Association's Plant Committee: Mr. W. M. Driggs, Chairman.* 19 *pp.* 1952.



MUCH OF THE SUCCESS of operating and maintaining a telephone property depends upon the performance of the people who are charged with the responsibility of keeping the system in working condition — not just keeping the system operating after a fashion, but keeping it operating well. Above, at right, M. F. THOMPSON explains to two future dial switchmen, how the equipment frame designation card, which he is holding, rapidly identifies the relationship of specific equipments located in the same or different frames.

success of operating and maintaining a telephone property depends upon the performance of the people who are charged with the responsibility of keeping the system in working condition — not just keeping the system operating after a fashion, but *keeping it operating well.*

There is a difference between these two levels of performance and the former is getting more difficult to tolerate as time goes on. This difference is a gap that cannot be closed — a difference that cannot be corrected — by trying to ignore its existence. The problem of measuring this difference and keeping it under control is one that deserves continual attention. But, again, just because a problem is complex is no reason why we should hide our heads in the sands of complacency.

The situation is such that some wide-awake telephone customers nowadays will not permit us to forget it, especially those who are footing the bill for modern telephone service and insists upon getting their money's worth. These exacting standards and demands of our customers automatically place heavy responsibilities upon each and every member of telephone plant maintenance organizations because of the key position they occupy in the overall service picture.

In all fairness it should be mentioned in passing that there may be customers who might attempt to take advantage of one's good nature as the following story illustrates:

Obliging Waitress: "How would you like your eggs served, sir?"

City Slicker: "Is there any difference in price?"

Obliging Waitress: "None whatever, sir."

City Slicker: "Then serve 'em on a thick slice of fried country ham!"

Technology Trend

WHAT ARE SOME of the conditions that are influencing the demand for the technical workers required to maintain telephone plants?

It is quite generally appreciated that technological changes and scientific advances along a broad front have injected a higher percentage of technology into everyday life. This state of affairs is recognized even to the extent that future housewives are studying the principles of physics from such textbooks as that written by Madalyne Avery entitled: "Household Physics." The popularity of this text is attested by the fact that it has been necessary for the Macmillan Company to print three ediions of the book to meet the demand.

The interesting fact is becoming clearer as each year rolls by that the laws and concepts of physics are so closely related to everyday life that every person who lays claim to being well-informed should have some degree of familiarity with the subject. As has been so well-said recently so many times: "One cannot be in tune with his age without understanding something of science."

The recent upsurge in interest throughout the country in the serious shortage of technical personnel, discussed later in this article, has resulted in an overdue revival of attention to the importance of physics in our workaday world.

What Is Physics?

THERE ARE MANY definitions but, briefly, physics is an attempt to describe or explain the material world in a simple way. It is the study of factors that make industry possible. It is usually subdivided for convenience into branches among which are included such fundamental subjects as sound, magnetism, electricity, and electronics, all of which are recognized as foundation stones undergirding communication technology.

Fortunately, of the writing of general physics textbooks there seems to be no end. They are obtainable in various degrees of simplicity to match the different levels on which learning takes place. The reason for this is that there are any number of ways of explaining anything. It is not a question of which is the correct way; it is rather a question of which is the better one for the purpose.—(*To be concluded in the next issue.*)

Worth Writing For

IMPORTANCE of using a scientific marketing approach in today's highly competitive business climate, and some general procedures for establishing a planned, scientific marketing program based on market facts and geographic market potentials are featured in a new 40-page publication released by Office of Distribution of U. S. Department of Commerce.

"Market Analysis Tools — County Business Patterns," is available at 20 cents per copy from Government Printing Office, Washington 25, D. C. . . .

"In beautiful colors . . ."

". . . so easy to hold . . ."

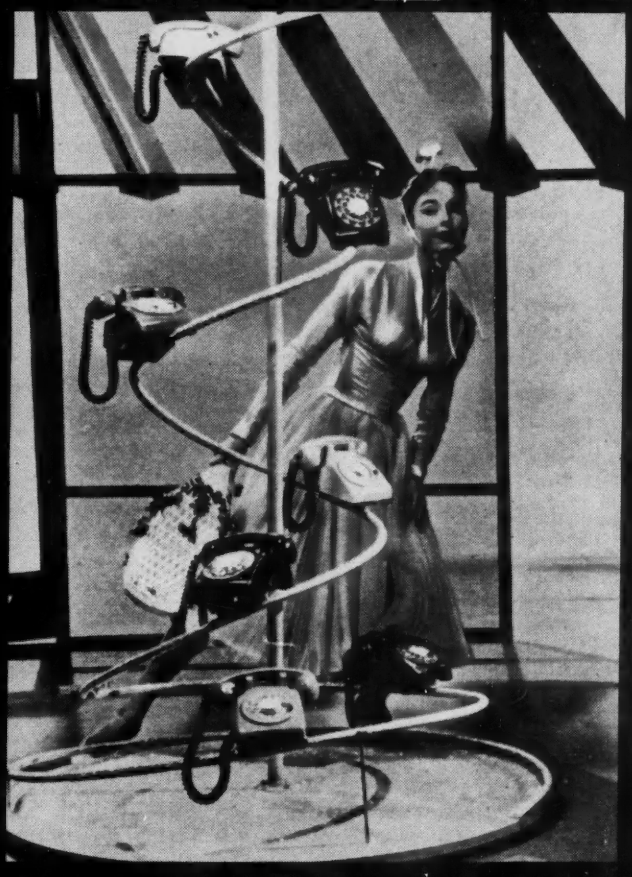
Millions watched her shop for telephones!

She's the lovely ballet dancer featured in one of the commercials shown on "Telephone Time," the Bell System's television show. Blithely and beautifully she danced her way through an enchanted store, choosing telephones for her family, her friends, herself. This month "Telephone Time" is beginning its second year on nationwide television. Every week its commercials will advertise what's new, different and desirable in telephones and telephone services. These commercials, we believe, are contributing to the sales efforts of the entire telephone industry. We hope that yours is one of the millions of homes this program reaches. It's on ABC-TV. Your local paper will give you the time and station.

BELL TELEPHONE SYSTEM

"... cords that s-t-r-e-t-c-h ..."

"... telephones, telephones, dream telephones!"



"Don't Be A Hermit- Participate In Civic Affairs"

By ERNEST W. FAIR

PARTICIPATION in civic affairs may involve the expenditure of time and money but such activity invariably pays off in good public relations for the company.

"IT'S A WASTE OF TIME . . . you can't build business by doing anything but sticking to that business!" This emphatic statement was directed our way by a company executive with a very small business and from all indications he was going to be in the same position for the rest of his life.

"It's a part of my regular business planning. I consider the participation of my firm as well as myself in civic affairs all the way from the local to the national level an absolute must!"

Three different executives made this statement in almost identical words to us recently. Their own success and the steady growth of the firms they head were evident to one and all.

In business results pay off every time. The positive or negative answer to the problem of whether or not the telephone company executive should participate in civic affairs is being demonstrated by those executives who do so. Invariably the really successful executives do just that; the so-so successful firms and their officials do not.

Between the two we know of many score telephone company executives who know such participation to be a positive asset but are wondering as to the actual amount of return they will receive therefrom. They are ready to take a decided step in either direction but remain uncertain along which avenue to proceed.

We've asked many executives, in this industry as well as others, how their active participation in civic affairs, both locally and nationally, and particularly at the local level, has paid off and what are the specific benefits they have received from doing so. Here is a summary of the many ideas and suggestions received in those interviews.

(1) "*Your firm grows with your community — its welfare is tied up with the success of your community.*"

This we heard over and over again. In larger measure it applies out from one's city to the national areas as well. Even in the telephone industry the success of one's own community has direct bearing on the success of the company franchised therein.

Good, big and prosperous communities create business in themselves. What is more they attract business and attract it in such volume that the momentum, once generated, continues to pile up.

Such growth is seldom accidental. It comes from hard and concentrated pushing by scores of business men in every community. Often it takes the full effort of every individual therein . . . one lagging back to let the other fellows do the job denies that extra ounce of pressure needed to create success.

The importance of that "extra ounce" has been demonstrated again and again in the history of our country. Many a drive has failed simply because it lacked the push of one single individual to put it over despite that being given by others. The good health of every business community depends on the civic contribution of every individual therein . . . not just a few.

(2) "*Civic activity participation broadens your executive ability.*"

Management ability consists of a great deal more than good overall knowledge of the telephone industry. Every other phase of business activity can contribute to that executive ability. Good ideas come from all over the business field. The more we participate in civic affairs the more exposed we are to meeting these executive ideas.

Many a telephone company executive has pointed out to us that his best ideas come from association with other executives and civic leaders. The difference between success or failure at a job can very often come from not only being constantly aware of what is happening in our com-

munity but in finding good ideas used by other executives in other fields and adapting them to our own particular job.

Participation in civic affairs with other business leaders gives one the opportunity to do this. Remaining aloof makes it difficult for us to ever know what is happening or have the opportunity to learn about such things.

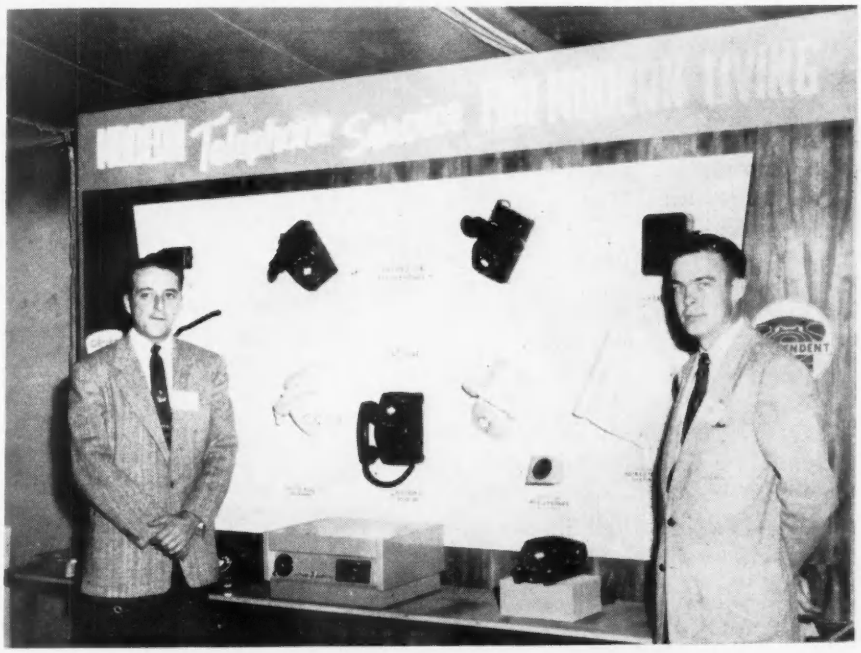
(3) *"It helps to create the laws which protect your business interests."*

Participation in civic affairs has been likened by one such executive to personal lobbying by every business man in city and state affairs. No business can be successful under adverse legal restrictions. The surest way to make certain that such deterrents to business success need not be beaten down later is to see to it that they never arise.

The executive's active participation in civic affairs permits him to nip such proposals in the bud; to sidetrack them before they become public issues and a great deal more difficult to fight. It also makes sure that from week to week, and this is even more important, other civic leaders both in and out of business are made aware of the real problems of his own business.

(4) *"I've always found people ready to help rather than hurt any line of business,"* one such executive told us. *"Too often the unhappy situations arise out of misinformation or the complete lack of knowledge. My continued and active participation in civic affairs has made certain that these people who shape the destiny of my community know and understand not only my own business but the entire field. With that understanding I've found them much more interested in helping than they would be without such knowledge."*

Participation in civic affairs is a public relations job no amount of money can buy. Little business grows into big business through such good public relations. Some times it is generated and sustained by specialists in the field of public relations. Always it is fostered and nurtured by the individual company executives themselves. Very active participation in civic affairs is invariably their topmost contribution.



"Participation in civic affairs with other business leaders broadens the executive's knowledge of his community and its people."

Good public relations work is today recognized as an integral part of every telephone companys executive's job day-to-day and not once every month or so. The obscure business never achieves the financial success which comes to the firm well-known, well-liked and recognized as THE leader locally.

Many executives tell us they consider participation in civic affairs their most important contribution public relations wise. The expenditure of time and money they give to such work invariably pays off in handsome public relations returns.

(5) *"Worthwhile things are accomplished with know-how in civic affairs and failures invariably result because of the lack of skills on the part of those trying to do the job."*

This statement was made to us by a civic administration expert some time ago. It holds true more today than it did than for each passing year finds the problems in every community becoming more complicated than ever before. There was a day when they could be handled by any reasonably intelligent individual; today it takes more . . . the know-how.

Few communities are rich enough to afford the hire of a horde of such experts to get the job done right. The resulting tax burden would be too great *and* it would be unnecessary.

Every executive who reads these pages possesses such know-how or he would not be an executive; it is an important ingredient to his acquiring his business post and to holding it.

Each of us can contribute a small part of that required know how without cost to our community through active participation in civic affairs where our contribution will bear greatest results. The cost to each of us as an individual is small; the sum total from all of us is great indeed.

Studies of communities where such contributions are non existent from business executives invariably reveal them to be backward cities whose business firms are lagging far behind those in other areas. They are "Let George Do It" communities . . . usually without any George present at all!

(6) *"It makes one's personal as well as business life more worthwhile."*

Living as a hermit may have its advantages but few telephone company executives want such an existance. Being a hermit in our community affairs invariably denies us much of the worthwhile things in our personal and business lives.

The success of our business assuredly comes from the success of the community in which it lives. The exceptions are few and far between. The rule applies equally well to our personal life.

Active participation in civic affairs not only broadens the horizons of one's business but of one's personal life as well. It makes sure that we have the type of community in which we

HERE'S SAFETY—SERVICE

you can always depend on. For Klein tools and equipment are designed better for your jobs—made of the finest materials—individually tested and inspected. Look for the familiar Klein trade-mark—serving the electrical industry "since 1857."

Write for Free Tool Guide

A free copy of the new Klein Pocket Tool Guide will be sent to anyone interested on request.

Ask your supplier

Foreign distributor:
International Standard Electric Corp., N.Y.

Mathias Established 1857 KLEIN & Sons Chicago, Ill., U.S.A.
7200 McCORMICK ROAD • CHICAGO 45, ILLINOIS

want to live and work. It is something we can never afford to leave in the hands of the other fellow.

Even where the latter individual accomplishes these things for us we cannot receive full benefit from them without active participation in civic affairs ourselves. It is most difficult to enjoy swimming by standing alongside the pool and watching others therein.

(7) "*Your active participation helps keep the 'crackpots' down.*"

Have you ever noticed that the communities from which weird political ideas arise are those with a noticeable lack of civic activity by their business leaders? Again and again business has been forced to wage a hard and expensive battle against such damaging theorists simply because no one thought it important enough to take over leadership and delegated it to them by default.

Without exception such 'crackpots' are most energetic . . . their zeal requires not just the counter-activity of one executive but that of many score. Holding them in check calls for the active civic participation of *every* business man . . . not just one or two.

(8) "*I'm too busy doing my job . . . let people who have less to do take care of such things,*" is an executive complaint heard too often even today. Civic affairs are an important part of every business operation in any community.

Those other individuals "who have less to do" never possess an understanding or feeling for our business. Too often their minds are warped in the opposite direction. When we leave civic affairs to them entirely we are virtually hiring someone (through our personal and business taxes) to make it more difficult to handle our executive posts.

"It makes my own job easier." — That is a statement we heard over and over again. Every executive who had been active in civic affairs over an extended period of time found it to be one of the top assets he acquired by doing so.

How? Business, as we soon learn, is built on contacts. The more we participate in civic affairs the more such worthwhile contacts we make. Some results in business gains directly while others accomplish it indirectly.

Secondly, it enables many an executive to quickly find the solution to a tough business problem. We can call on others for advice and assistance only when we know such people personally; stranger-to-stranger contact seldom produces the results we need. Long civic affairs participation provides this bond of personal friendship which makes it easy to secure such help with speed when it is needed in an emergency.

And finally, it always makes an executive's job an easier one through his broadened business understanding. Today's problems invariably touch upon other fields. The more we know of these the better we can handle those situations. Such knowledge is a most important by-product of every executive's participation in civic affairs all the way from the local to the national level.

Book Review

"*Company Organization For Economic Forecasting: Keeping Informed on the Business Outlook.*" Published by the American Management Association, 1515 Broadway, Times Square, Dept. TE&M, New York 36, N. Y. Research Report 28. 86 pages. Price: $3.00 .

Accurate long- or short-term forecasts of the economic outlook are increasingly essential. Recognizing this need, more and more pertinent economic data is being made available from government and business sources.

How companies are using his data — how they have organized or are preparing for economic forecasting — is described in this new AMA publication. Examining a detailed AMA survey of the forecasting practices of fifty-six company presidents, the report explains how the chief executives of typical businesses keep informed on economic trends by reference to trade publications and periodicals, use of trained forecasters, and other methods. From this survey, conclusions are drawn on the forecasting function — its organization, its effect on company planning, its practicality.

Another AMA survey examined in this report involves actual case histories in economic forecasting of twenty-one companies representing many business and industrial areas. Aspects of forecasting reviewed include: preparation of reports, circulation and use of these reports, and delegation of responsibility for the job of forecasting.

Iowa Association Holds Annual Convention

Nearly 900 Attend Iowa Convention: Ross K. Vernon Re-elected President

THE BIGGEST convention in the history of the Iowa Independent Telephone association was held at Hotel Fort Des Moines, Des Moines, April 2 and 3 when nearly 900 persons attended the 62nd annual meeting of the oldest and largest state association of Independent companies.

With the convention theme "PRogress 4-1957" setting the pace, convention delegates and their wives heard speakers and panels cover phases of the industry ranging from accounting to legislation, with special attention focused on the accelerating dial conversion program in Iowa.

In one of the most unusual turnouts in the history of the Iowa legislature, 143 Iowa state senators and representatives — all but 15 of the total number of legislators — attended the convention banquet as guests of the association, according to William Miller, secretary-treasurer.

Highlighting the convention were announcements that an automatic long-distance switching system will begin operation in Des Moines June 16, that six bills to regulate public utilities in Iowa apparently will fail to pass the legislature; and that the state's 471 Independent companies may achieve full dial conversion by the end of 1963.

In the opening address to the convention, Ross K. Vernon of Sioux Center, re-elected to his second consecutive term as president of the association, reviewed the rapid growth of the Independent industry in Iowa and the nation and called for continued cooperation to meet the challenge of the future.

"We have no idea that our future increase in business will fall neatly into our laps," he said. "We must continue to seek ways and means to sell and to improve our service."

Mr. Vernon, who is president of the Mutual Telephone Co., Sioux Center, called on the convention to consider the future of the industry in terms of expansion and rehabilitation

DIRECTORS of the Iowa Independent Telephone Association from the left, first row, EARLE BELLAMY, Knoxville; A. W. SANDERS, New London; LOYD MORRISON, Grinnell; H. B. MELICK, West Liberty; CLYDE McFARLIN, Montezuma; ARTHUR LONG, Sloan; ROSS VERNON, president, Sioux Center. Second row from the left: L. E. TRAVIS, Newton; JOHN McINTOSH, Cedar Rapids; E. G. CARLSON, Creston; C. C. PEARCE, Riceville; J. L. TREVILLION, Chariton; E. E. ZERWAS, Manning; HAROLD THOMPSON, Clear Lake; ROY E. BRANDEL, Mt. Pleasant; M. F. OBERG, Des Moines; V. D. PECK, Primghar; WILLIAM MILLER, Des Moines, secretary-treasurer. Not present when this picture was taken were Directors W. H. FOWLER, Pella; A. L. KELLEY, Clarinda; JOSEPH L. VAN HORN, Grinnell and HENRY F. MELICK, West Liberty. Mr. Morrison and H. B. Melick are honorary directors.

if you want dial . . .

it's **KELLOGG** for

THE MOST COMPLETE

CROSSBAR

Crossbar switching allows you maximum expansion . . . requires practically no routine maintenance . . . gives you high traffic capacity . . . has convenient drawer mounted switches which are easily accessible . . . allows PBX grouping service . . . is adaptable to inter-toll dialing.

STEP-BY-STEP

Step - by - Step switching gives you long life and low cost operation . . . is expandable for increased station and traffic requirements, allows trunking flexibility . . . is easy to check and adjust (each switch is a separate unit) . . . is compact and space-saving.

RELAYMATIC

Relaymatic all-relay switching is simple to install and easy to maintain . . . . operates with any type of trunk line . . . allows you up to 10 party selective divided ringing . . . has adaptors available for grounded rural lines.

TE LINE IN THE WORLD !

Your Kellogg representative is well qualified to help you choose the dial system that best fits your needs . . . only Kellogg offers a complete line of dial equipment to the independent telephone company.

For more detailed information on any of these systems ask your Kellogg representative.

7-A2 ROTARY

Rotary switching gives you the advantages of motor driven, register-type system . . . allows large trunk groups and is adaptable to inter-toll dialing.

PABX'S

For PABX's you have your choice of several types of switching: cross-bar . . . step-by-step . . . or relaymatic . . . in all sizes.

KELLOGG

A DIVISION OF IT&T

KELLOGG SWITCHBOARD AND SUPPLY COMPANY

A Division of International Telephone and Telegraph Corporation

Sales Offices: 79 W. Monroe St., Chicago 3, Ill.

PHONE: DEarborn 2-0750

KELLOGG Branch Warehouses and Offices:

6000 W. 51st Street
Chicago 38, Illinois
REliance 5-5445

4501 Truman Road
Kansas City 1, Missouri
Humboldt 7085

410 N. Syndicate Avenue
St. Paul 4, Minnesota
Nestor 5878

504 County Bank and Trust Bldg.
Passaic, New Jersey. Prescott 9-3610

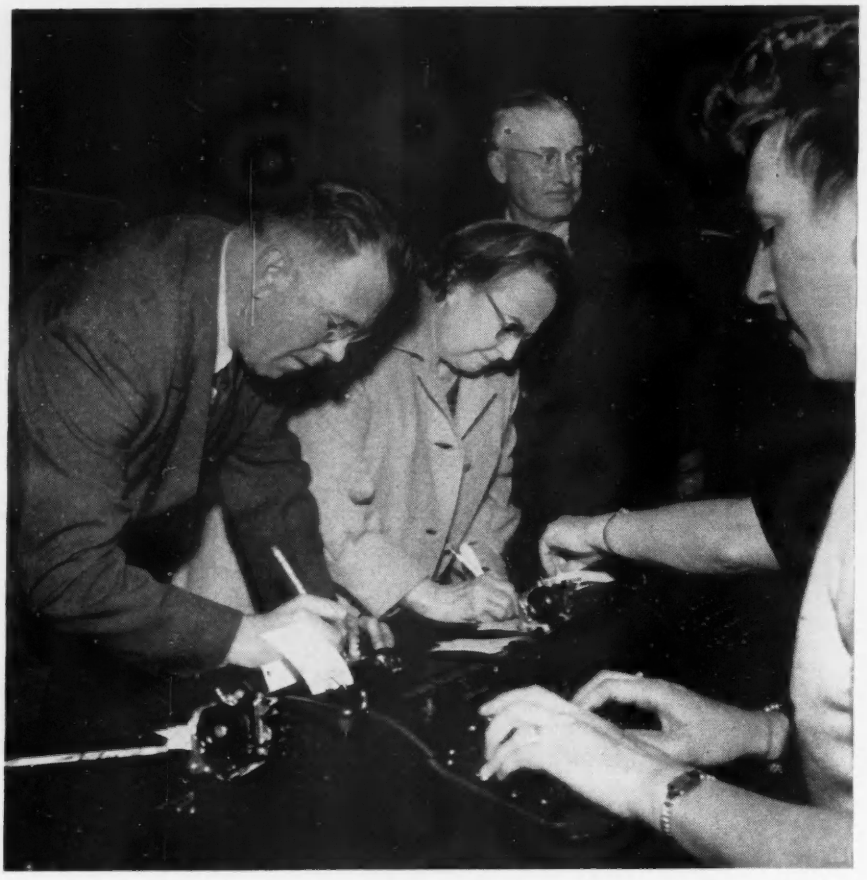
1515 Turtle Creek Blvd.
Dallas 7, Texas
RIverside 7-5191

23 Broderick Road
Burlingame, California
OXford 7-5780

1555 West Fourth Street
Mansfield, Ohio
Mansfield 7-2816

1594 Southland Circle, N. W.
Atlanta, Georgia
Sycamore 4-2441

Export Distributor:
International Standard Electric Corp.
50 Church Street
New York 7, New York.



REGISTERING EARLY, and just a step ahead of the crowd of nearly 900 persons who attended the Iowa convention, were, from nearest the camera, JOHN D. BROWER, manager; AVIS KERKMANN, secretary-treasurer, and ARTHUR H. TAYLOR, vice-president of the Massena Telephone Co., Massena.

A BIG WELCOME to the Iowa convention is extended by WILLIAM MILLER, right, secretary-treasurer, to L. E. TRAVIS, general manager, United Telephone Co., Newton; and CLYDE McFARLIN, president, Montezuma (Ia.) Telephone Co. Mr. McFarlin, second from left, is a director and past president of the association. Mr. Travis is a director and a member of the inter-company committee on nationwide dialing.

of exchanges, new services, new merchandising programs, new financing methods, technical advances, management training, recruitment of younger and trained personnel, and co-ordinating efforts of Independent companies in exchange areas.

All officers and executive committee members of the association were re-elected. They are Mr. Vernon, president; John J. McIntosh, Cedar Rapids, first vice-president; Harold Thompson, Clear Lake, second vice-president; and William Miller, Des Mines, secretary-treasurer.

Executive committee members re-elected were Mr. Vernon, Mr. McIntosh, Mr. Thompson, Earle Bellamy, Knoxville; Edward G. Carlson, Creston; Marvin F. Oberg, Des Moines; and C. C. Pearce, Riceville. Mr. Vernon is chairman of the committee.

Seven members of the board of directors re-elected were Mr. Bellamy, Mr. Vernon, Mr. Carlson, A. L. Kelley, Clarinda; V. D. Peck, Primghar; A. W. Sanders, New London; Joseph L. Van Horn, Grinnell.

E. C. Weitzell, Washington, D. C., chief of the telephone operations and loans division of the REA, told the convention a recent survey shows that, in seven north-central states, including Iowa, the per cent of farms with phones increased from 62 per cent in 1950 to 70 per cent in 1956.

"The present estimate for Iowa is that about 88 per cent of the farms have telephone service of some kind. This is one of the highest percentages in the country," he said.

He said about 55 per cent of America's farmers have dial service, but that only about 35 per cent of the farm phones are dial in the seven north-central states. "We know there is much improvement under way now," he said, "but there is much more to do."

He said the aim of Independent telephone companies should be to "establish themselves as economically efficient units that merit the financing and management modern telephony requires."

Mr. Weitzell said companies can be reasonably certain of eligibility for an REA loan if they are large enough to be economically feasible, incorporated or willing to incorporate, if the purpose is to provide rural telephone service, if re-financing would constitute 40 percent or less of total financing needs, and if rea-

sonable security can be offered in terms of good title to property.

He said the new loan security policy of the REA means that for "commercial companies with experience and demonstrated managerial ability, no additional equity may be required in addition to existing assets."

"However," he said, " the new mortgage places certain controls over dividends on common stock and salary increases until the borrower has achieved a minimum net worth of 10 per cent."

In his report on legislation, Clyde McFarlin of Montezuma, a director and past president of the association, said six bills introduced in the Iowa legislature this session to regulate public utilities, including telephone companies, aparently will fail to pass. Iowa telephone companies are not now regulated.

He warned, however, that resistance to regulation by Iowa companies has incurred a "background of resentment" among utilities seeking regulation.

"We must not overstay our time," he said. "The day is coming when we will be regulated and we will not be realistic if we do not face the fact."

He advised that the Iowa Independent industry should start thinking in terms of a "good" regulatory bill in order to avoid the eventual passage of "bad" legislation.

The scope of the Independent telephone industry in the nation was outlined by Hugh A. Barnhart. Rochester, Ind., second vice-president of the United States Independent Telephone Association.

He said there now are 4,500 Independent telephone companies in the United States and territories serving nearly 9,000,000 telephones in 11,000 communities. The companies represent an investment of nearly $2,500,000,000, have annual gross revenues of approximately $667,000,000, and handle more than 40,000,000 local and long distance calls every 24 hours. There are 751 Independent exchanges in Iowa alone.

SWAPPING SHOP talk at the convention were, from the left, LYLE FRENCH, local manager, Central Iowa Telephone Co., Belle Plaine; LEON W. YOUNT of Logan, district manager for the same company; C. W. CARLSON, manager of the Mutual Telephone Co., Mediapolis; BASIL DUFFY, manager of the Mallard Telephone Co., Mallard; and E. H. GAMES, a director of the Citizens Mutual Telephone Co., Bloomfield.

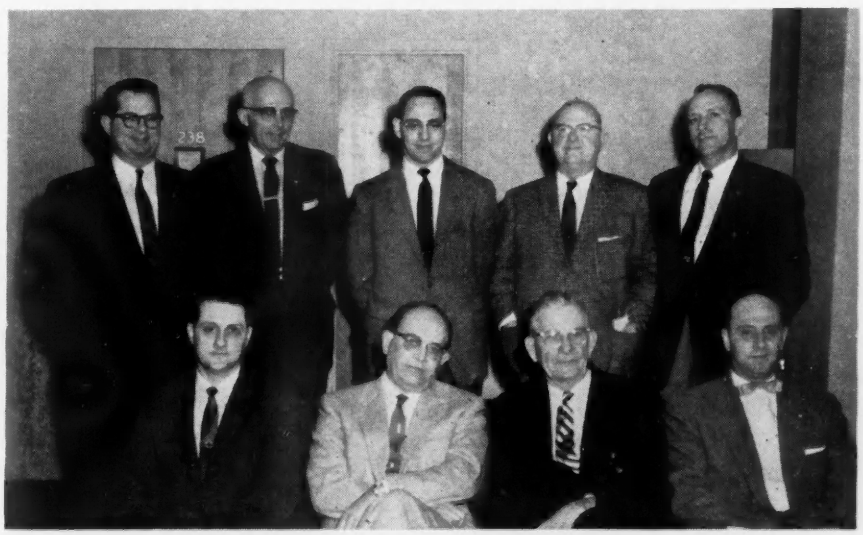
In his report to the convention, Secretary-Treasurer Miller outlined a tentative schedule calling for the conversion to dial of all Independent telephones in Iowa by the end of 1963.

He said that a total of 171,580 of the 353,000 Independent telephones in the state will be converted to dial operation by the end of this year. Presently, according to Mr. Miller, 225 of the 471 Independent companies in the state are dial operated. Of this number, 159 made the conversion to dial within the past five years, he said. Miller said an estimated 62 independent exchanges in the state will convert approximately 51,000 telephones to dial this year.

Marvin F. Oberg, vice-president and general manager of Northwestern Bell Telephone Co., said an automatic long-distance switching system going into service in Des Moines June 16 will be the "largest single project in Iowa telephone history.

"Altogether Bell and Independent companies are investing about $5,000,000 in long distance mechanization alone in the two-year period, 1956-57," Oberg said.

Extending from the Des Moines system will be 1,272 dialing lines of



OFFICERS AND DIRECTORS OF KENTUCKY TELEPHONE ASSOCIATION:— Seated Left to right: J. A. REITZE, sec.-treas.; H. J. WRIGHT, pres.; W. L. PARR, vice-pres.; J. F. WIBBELER, vice-pres. Standing: S. S. LONG, M. V. SHEPHERD, L. T. UTZ, P. H. McCRORY, and W. W. THOMASON. A. L. DAUGHTERS, also director, absent. 250 attended the recent convention of the Kentucky Telephone Association at the Phoenix Hotel, Lexington.

construction and maintenance DIGEST

- **Country-style thrift**
- **25-year battery**
- **5-in-1 protection**
- **Perfect protection**
- **3 ways better**
- **Love this petticoat**
- **Paper for insulation**
- **Long-lived service**
- **Anti-aging cable**

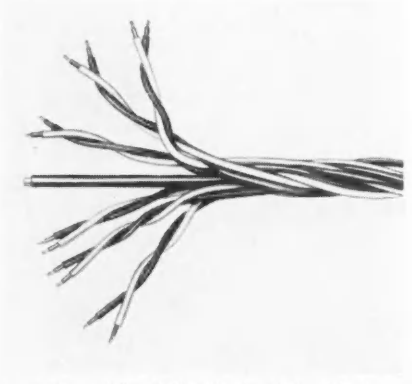
Published regularly to help you get the most out of your materials and supplies dollar

by Gerald C. Gaydos, Inside Sales—Chicago

In my spare time I like to do crossword puzzles, but there's never any puzzle about the advantages of ordering supplies from Stromberg-Carlson. No matter where you're located, you're protected by a double guarantee on the fine products you order from Stromberg-Carlson . . . ours, and the maker's. This way, when emergencies make special demands—you're not alone. You find **two** solid companies right beside you, eager to help. That's how our 62-year reputation in the industry has grown. That's why it pays you to order from Stromberg-Carlson—leader in the research for new and better telephone equipment. We'd like you to know we appreciate your support.

Rural Distribution Wire Gives Speed Plus Economy

For fast, low cost construction specify Ansonia Lightweight Rural Distribution Wire.



Ankoseal Rural Distribution Wire Ideal for Temporary Service or Cable Relief

It comes with plastic-insulated #19 A. W. G. soft copper conductors in color-coded parts, which are cabled around a polyethylene-insulated .109 high strength galvanized steel support wire. Each conductor pair has a controlled different length twist to avoid crosstalk.

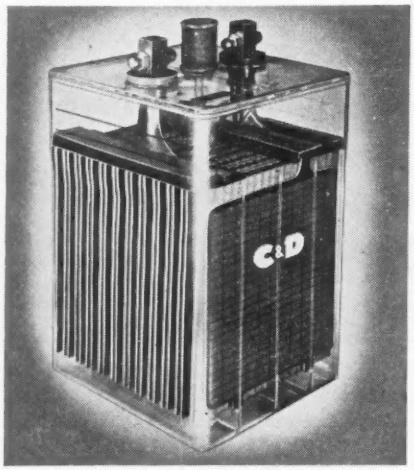
A breaking strength of 1800 pounds makes this Ansonia Wire & Cable Company product ideal for temporary service or cable relief.

Your Stromberg-Carlson representative can offer prompt delivery on your order.

Battery will still have its pep when 1982 rolls around

It will last 25 years—in full float service! That's the life expectancy of C & D's PlastiCal (lead-calcium grids) telephone battery.

You get this extra-long, trouble-free operation because C & D Batteries, Inc. use an exclusive suspended and supported plate construction.



In full float service, this telephone battery stays on the job a quarter of a century.

Illustrated here is a typical C & D telephone battery with a 660 A.H. capacity. When ordering this 25-year battery, specify PCE-660.

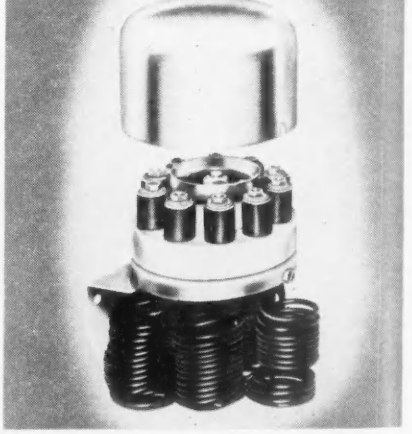
When you find that a 14-year expectancy meets your needs, you can get dependable operation from a C & D PlastiCell (high-tensile lead alloy grids) battery. For a PlastiCell with capacity of 660 A.H., specify CE-23.

You can order either of these C & D telephone batteries, plus other capacities, from your Stromberg-Carlson representative. Ask him about extra-long-life power supply with C & D Batteries.

Protects 5 circuits at low cost

You get low-cost protection for 5 circuits with Cook Electric Company's Hy-Cap Power-Cross Protector—a single compact unit with only one ground wire.

In the assembly of this unit 10 carbon electrodes are fixed to a porcelain base which has a snug-fitting, weatherproof aluminum cover. Each electrode has a fusible element which forms a direct path to ground when an extended discharge occurs. Ten insulated copper wire leads are factory-connected to the protector and cut to correct lengths for installation on a 10B crossarm. Wire entrances are sealed with rubber grommets. A steel bracket makes mounting easy.



Protect 5 circuits with this one compact unit.

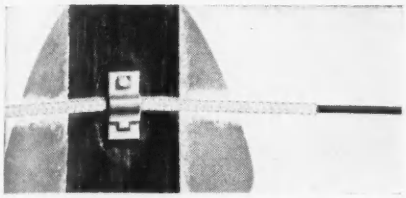
If all 5 wire leads are not needed at installation time, you can leave the extra wires coiled until facilities are increased.

Protects plastic cable from pressures, abrasion

Ties, clamps, trees and other objects are rough on plastic-covered self-supporting cable.

The perfect protection is a Preformed Line Guard—available in metal or plastic.

Metal line guards are specially useful for supporting cable at poles. They are a must for tangent supports. They spread the pressure around—preventing slippage and preventing damage to the plastic covering.



Available in standard 6-ft. lengths. Other lengths on request.

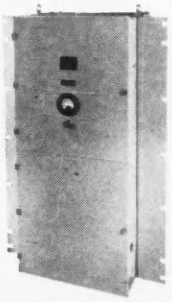
Plastic line guards are ideal for protecting and insulating conductors that pass through trees, close to buildings, or over other lines.

Both install easily. Just wrap them around cable. You need no tools, no clamps or clips.

Order from Stromberg-Carlson.

Raytheon Rectricharger® Battery Chargers—Complete Line 3-400 Amperes

Entirely redesigned new Raytheon Rectichargers offer three major improvements:



New Raytheon battery chargers feature ±1% no-load to full-load regulation

1. ±1% no-load to full-load stabilization prevents battery overcharging, minimizes gassing, lengthens battery life.

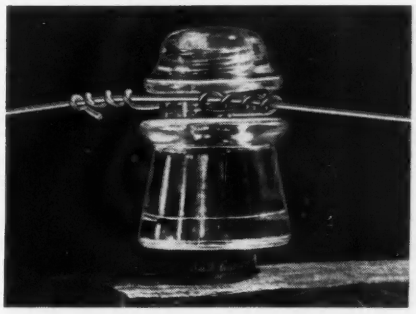
2. No audible hum at output terminals.

3. Most compact units on the market—wall or rack mounted.

Automatically compensated for rectifier aging, Rectichargers offer high efficiency, completely automatic regulation. No moving parts and self-protecting circuitry assure minimum maintenance, long life. Single and three phase, 3-400 amps.

Single-petticoat insulator has *long* leakage path

You get just about the longest leakage path possible with a single petticoat, on this Hemingray Number 17 insulator for medium length lines. It gives you excellent service through all sorts of weather, protects the pin from moisture, and isn't disturbed by sudden or seasonal changes in temperature.



Long petticoat, small size make the Number 17 insulator highly useful.

It's easy to put up, too, because it has a full 7/16" square groove, over ⅜" deep, which provides better support. This means you can work faster, and be sure you are putting your lines up to **stay**.

You save money both ways—on installation time **and** maintenance time. Hemingray insulators are made by Kimble Glass Company, subsidiary of Owens-Illinois, and have been the "World standard since 1870."

Paper-insulated Telephone Cable for unsurpassed performance

Kennecott Telephone Cable is made with conductors of 19, 22, 24 and 26 AWG annealed copper wire.

Each wire is insulated with (one or more wraps) of manila paper, or paper made from clear rope stock with suitable proportions of wood, pulp or cotton rag stock added.

The paper is wound in helical form around the wire. When two papers are used, they are applied in reverse direction.

Dry paper is used because of its excellent electrical and mechanical properties.

After insulation of the conductors, they are twisted together to form pairs, each wire of a pair being wrapped with paper of a different color for tracing purposes.

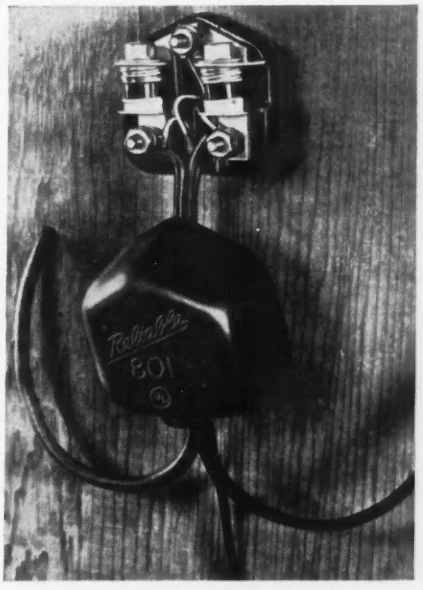
The twisted pairs are cabled together in layers, each layer being one pair thick. Alternate layers are cabled in opposite directions. The complete cable core is taped over with paper.

After removal of moisture by heat and vacuum, the cable is then sheathed with lead containing 1% antimony.

Fast delivery available from your Stromberg-Carlson supply representative.

Long life under all conditions

You get long service life under all kinds of weather conditions with the Series 800 Fuseless Protector, recently developed by Reliable Electric Company.



Easy to install and maintain

This new protector is available with Reliable No. 504 Protector Units (as No. 801) for station protection and with Reliable No. 506 Protector Units (as No. 801A) for cable protection.

The weather-tight neoprene cover has passed the Underwriters Laboratories severe requirements for performance and weathering under temperature extremes. The protector is listed under UL Re-examination Service.

(*Continued on Page* 58)

(*Continued from Page* 57)

construction and maintenance digest

The neoprene cover fits snugly and drops out of the way conveniently when protector is installed or serviced.

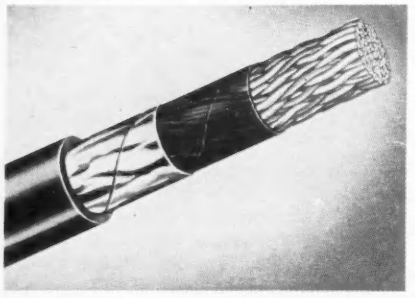
Cable has polyethylene sheath for extra-long life

In outside cable installations, you can side-step the ravages of weather, sunlight and temperature, saving yourself many dollars and hours in maintenance.

To do this, use the protection of the polyethylene sheath on Whitney Blake Telecable®. Telecable exchange area cable for aerial and duct use has polyethylene insulation **and** polyethylene sheath. No other thermoplastic material has given as good assurance of aerial cable sheath life expectancy as has polyethylene.

Specially treated to resist sunlight, the Telecable sheath has maximum chemical resistance, is not subject to environmental cracking.

Extremely light in weight, tough, yet flexible, it resists the stresses encountered during installation. You can expect top performance of Telecable for upwards of 20 or 25 years.



Telecable exchange area cable has outstanding weather resistance and transmission qualities.

Available in No. 24, No. 22 and No. 19 A.W.G. in sizes up to and including 404 pairs.

Distributed by

STROMBERG-CARLSON

A DIVISION OF GENERAL DYNAMICS CORPORATION

Sales Offices: Atlanta 6, Chicago 6, Kansas City 8, Rochester 3, San Francisco

which about 700 will terminate in 44 other Iowa long distance switching centers. Some 600 others will terminate in key cities from coast to coast, he said.

He said the number of long-distance calls dialed by operators on an average day under the new system is expected to be about 67,000 — more than double the number dialed today.

He said the system will employ one operator and an average of 24 seconds to complete a long-distance call compared to the five operators and average 108 seconds in the ring-down method.

Participants in an accounting symposium were Carl F. Eichler, moderator, New London; Marvin R. Bishop, Cedar Rapids; Clarence Henry, Creston; Arthur G. Kiesling, Madison, Wis.; C. C. Pearce, Riceville; and V. D. Peck, Primghar.

R. L. Post Joins Southwestern States Tel. Co.

R. L. POST, San Angelo, Texas, has been named public relations director for The Southwestern States Telephone Co., Brownwood, Texas. Mr. Post succeeds C. N. Davis who is organizing a telephone directory company.

A native of San Antonio, Texas, Mr. Post is a graduate of Southern Methodist University in Dallas where he received his Bachelor of Science degree in Journalism. He has been on the advertising staff of the San Antonio Light, San Antonio, Texas, news director of Radio Station KPAT in Pampa, Texas, and managing editor of the Alice Daily Echo, Alice Texas.

R. L. POST

C. N. DAVIS

Going to San Angelo about four years ago, he became assistant manager of the San Angelo Chamber of Commerce. He had been with General Telephone Co. of the Southwest at San Angelo in its Public Relations Department since early 1954.

Mr. Davis has been in the telephone business for about 20 years, serving about 10 years with the Southeast Missouri Telephone Co., and for the past ten years with Southwestern States. Most of his service in telephone business has been in the directory field.

Appointed public relations director last August when a separate company was organized to handle directory compilation and production for Southwestern States, Mr. Davis has continued to coordinate handling of directories between the two companies.

Mr. Davis has organized and will head the Independent Telephone Directory Co. which will maintain general offices in Corsicana, Texas.

IRE Communication Group To Hold Technical Session

FOR THE FIRST time in its history, the Western Electronics Show and Convention (San Francisco, August 20-24) will have a technical session on Communications Systems. Present plans call for one and possibly two of the 48 technical sessions of the 4-day show and convention to be devoted to the systems aspect of communication. Subject areas which may be included in the communica-

tions systems sessions are: multiplexing and channelizing systems, telephone and telegraph communications, modulation techniques, military communications and data transmission systems.

Authors wishing to present papers in these subject areas should send 100-200 word abstracts of their paper together with the complete text or detailed outline to: A. M. Seymour, WESCON Technical Program Committee, Lenkurt Electric Co., San Carlos, Calif., by May 5, 1957 for consideration by the Technical Program Committee.

This year, for the first time, an IRE-WESCON Convention Record will be published. It will include every paper presented at the convention and will be distributed nationally shortly after the convention.

Authors will be notified whether or not their papers have been accepted by June 1.

Michigan General Advances R. E. Kinsman

T. A. SAUNDERS, president, General Telephone Co. of Mich., has announced R. E. Kinsman, formerly district plant supervisor, Muskegon, has been named general plant construction supervisor.

Mr. Kinsman began his telephone career as a lineman in November, 1919. Since that time, he has served in various capacities in Three Rivers, Sturgis and Tecumseh, Mich. He returned to Muskegon in October, 1955, and, since that time, has been in charge of plant operations in the Muskegon district.

Progress Report Issued By Ohio Association

CONTINUATION of a vast expansion and improvement program which has increased every year since 1946, today places Ohio Independent telephone companies in the best position in their history to provide telephone service to customers throughout 70 per cent of the state's land area, it has been disclosed in the annual progress report of the Ohio Independent Telephone Association.

Progress made by Ohio's 131 Independent telephone companies during 1956, according to Daniel W. DeHayes, executive vice president of the association, Columbus, included the installation of 36,500 new telephones and the upgrading of service for thousands of additional rural and metropolitan subscribers.

In order to accomplish this, expenditures for new buildings, and inside and outside plant equipment were at an all-time high, exceeding $25,338,000. This expansion program will be continued during 1957, and the Independents will spend an additional $26,000,000 this year.

Much of this money last year was spent on converting manually operated exchanges to dial service, and at this time 81 per cent of all Independent operated telephones are dial. During the past year, 27 exchanges were converted to dial operation, and plans call for an additional 35 exchanges to make the switch this year.

Ohio Independents in 1956 increased the total number of customers served in 594 exchanges to 745,000 as compared with 390,000 customers they were serving in 1946. Of the total number of stations served last year, 177,000 subscribers were rural Ohioans.

In their efforts to keep pace with the ever increasing demand for more and improved grades of telephone service, Ohio Independents in 1956 erected 1,635 miles of new pole and 108,400 miles of wire line.

As further substantiation of the state's growth and the increased use of telephone communications as an important factor in this picture, Ohio Independent telephone customers made an average of 157,887,000 local calls per month last year and 3,670,000 long distance calls.

The Independent telephone industry in Ohio is one of the largest in the nation, and during 1956, more than 7,000 persons were employed by Independent companies, and they shared a payroll amounting to $20,885,000. Investing in the future development of the industry, 19,000 persons are today stockholders in these companies.

To continue their contribution to the state's rapid growth, Ohio Independent telephone companies, DeHayes said, are constantly taking advantage of the latest technological ad-

Please turn to page 62

New Director

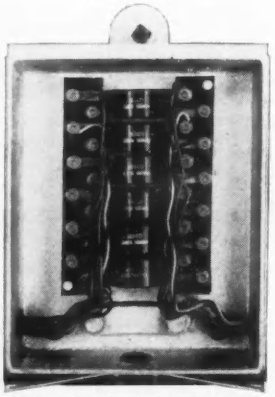
THE APPOINTMENT of *Richard H. Aue*, an executive of the Ohio Bell Telephone Co., Columbus, Ohio, as Director of the Communications Division of the Business and Defense Services Administration, U. S. Department of Commerce, was announced last month by BDSA Administrator H. B. McCoy.

In announcing this appointment, Mr. McCoy said that most of Mr. Aue's business career has been spent in the communications industry and he brings to the agency current expert knowledge of industry problems related to communications equipment.

Mr. Aue is on loan from his company and will serve for a period of some six months without compensation from the Government, after which he will be available as a reservist qualified by BDSA training to act in a similar capacity in any future emergency.

Mr. Aue succeeds Earle D. Pitt, general manager of the Southern Division of the Western Union Telegraph Co., who has returned to his company after serving as Division Director since last August.

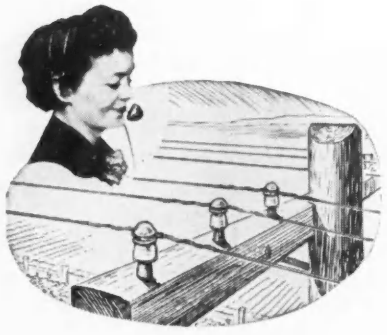
THESE LINE SUPPLIES



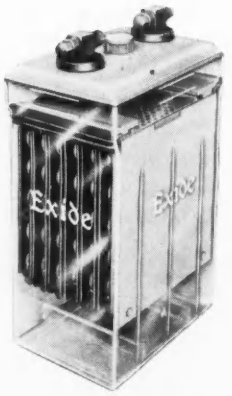
Type 177 Terminal-Loading Case. A cast aluminum combination terminal box and housing for loading coils. For use with the new rural distribution wire for 6, 11 and 16-pair capacity. Available in 8 types. Terminals, available with or without protectors, accommodate loading coils of 88MH or 44MH inductance. COMMUNICATION EQUIPMENT & ENGINEERING CO.

The Cook PLX Cable Terminal is designed for use on plastic cable that is looped through the terminal without cutting the wires and the desired pairs terminated for distribution. Protection is optional. When ordering, specify cable diameter for correct size grommets. COOK ELECTRIC COMPANY.

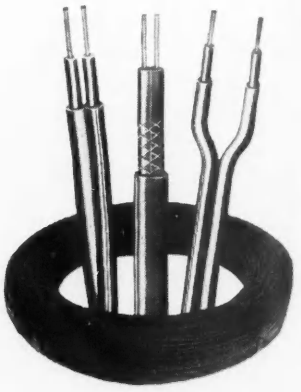
Pictured here are a few of the many top quality line supplies offered by Kellogg. Your near-by Kellogg warehouse or distribution point is ready to give prompt attention to your needs.



Copperweld Talks Better than any other high-strength conductor. Strong, nonrusting, easy to string, it's unequalled for long-life, long-span construction. Use .080"—30 E.H.S. for short subscriber loops and secondary toll lines—and .104"—40 H.S. for toll lines and long subscriber loops.
COPPERWELD STEEL CO.



The Battery That Stays Young for Years. Built right into the Exide-Manchex Battery is a reserve supply of lead that converts automatically to active material as it's needed during the battery's long life. Hence, it keeps its full capacity for years. Exide Industrial Division, THE ELECTRIC STORAGE BATTERY COMPANY.



Long Service Life and Low Plant Cos go hand in hand with the installation ENDURPRENE — The Neoprene Drop W available in both Copperweld and Bron This flexible and easy-to-handle wire made by GENERAL INSULATED WI WORKS, INC.

ESARE TOPS !

KELLOGG
A DIVISION OF I T & T

KELLOGG SWITCHBOARD AND SUPPLY COMPANY

A Division of International Telephone and Telegraph Corporation

Sales Offices: 79 W. Monroe St., Chicago 3, Ill.

Telephone: DEarborn 2-0750

KELLOGG Branch Warehouses and Offices:

6000 W. 51st Street
Chicago 38, Illinois
REliance 5-5445

4501 Truman Road
Kansas City 1, Missouri
Humboldt 7085

410 N. Syndicate Avenue
St. Paul 4, Minnesota
Nestor 5878

1515 Turtle Creek Blvd.
Dallas 7, Texas
Riverside 7-5191

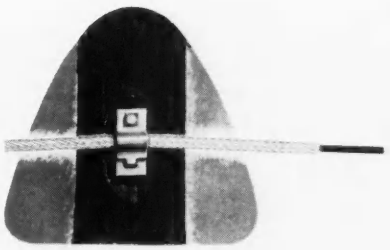
23 Broderick Road
Burlingame, California
OXford 7-5780

1555 West Fourth Street
Mansfield, Ohio
Mansfield 7-2816

1594 Southland Circle, N.W.
Atlanta, Georgia
Sycamore 4-2441

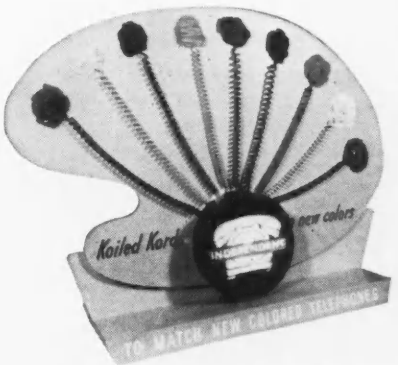
504 County Bank and Trust Bldg.
Passaic, New Jersey
Prescott 9-3610

mple, Quick, and Sure!—For splicing
o wires of different sizes, there's nothing
mpler than using Nicopress reducing
eeves and the Nicopress 31-DC tool.
lices are always tight and strong. Made
the NATIONAL TELEPHONE SUPPLY
OMPANY.



Preformed Line Guards for Plastic Self-Supporting Cable. No tools required. Line guards are accurately formed to fit snugly without using clamps or clips to hold ends secure.

PREFORMED LINE PRODUCTS COMPANY.



Koiled Kords—Customer satisfaction and long service life are assured with Koiled Kords retractile telephone cords. Black cords available for replacement. Black and colors available for use on all new equipment. Made by KOILED KORDS, INCORPORATED.

GENERAL MACHINE PRODUCTS
COMPANY, INC.
7th & Wood Sts.
Philadelphia 6, Pa.

Aerial Tents
Cable Benders
Cable Blocks
Cable Lashers
Coaxial Cable Tools
Lashing Wire Clamps and Grips
Portable & Power Reels

#7458 SEALING COMPOUND

The C Resin Compounded activator, when mixed together, produce the proper proportion of flowable compound, known as one unit, to produce a plug or dam when desirable to sectionalize cable and seal cable terminals. The compound and activator is packaged in two sizes: regular size 50 gram compound and 19 gram activator, large size 168 gram compound and 64 gram activator. Additional information is available on installation and on the tools required.

Distributed by Graybar

Special Purpose Tools To Specifications
Literature on Request

Over 450 various items of Line Construction Tools, Maintenance & Pressure-Testing Equipment in stock for immediate Shipment

SPECIALIZED COMMUNICATIONS EQUIPMENT SINCE 1918

GMPCO

A new, more comfortable chair for cashiers and draftsmen

The Sturgis 837

At last, solid comfort and posture support in a "high" chair! Big, soft, foam rubber cushioned seat. Foam rubber cushioned backrest curved to snuggle into the small of the back and give firm support. Footring located for comfort and welded to frame for stability and safety. This chair is available in three adjustable seat heights ranging from 20"-24", 24"-28", 28"-32". Ask your Sturgis dealer to show you the No. 837 High Master. The Sturgis Posture Chair Company, Sturgis, Michigan. Address inquiries to The Sturgis Posture Chair Company, General Sales Offices, 154 East Erie Street, Chicago 11, Illinois.

IF YOU USE THESE PRODUCTS . . .

send for the world's most complete, illustrated catalog of

ELECTRIC LANTERNS and SAFETY CANS

VALUABLE DATA:
The world's first comprehensive table of lamp and battery operating information
High power searchlights
All-purpose hand lights
Safety lights and lanterns
Flammable liquid SAFETY CANS
Oily Waste Cans

JUSTRITE Mfg. Co.
2061 N. Southport, Chicago, Ill.

CATALOG NUMBER 569

vances such as microwave transmission of conversations, direct distance dialing, and the use of transistors in central office equipment to provide an increasingly improved and expanded network of communications for all Ohioans.

General Tel. Announces Personnel Dept. Changes

SEVERAL changes in the staff of the personnel department within General Telephone System have been announced by Donald C. Power, president.

Edgar H. Alms, former division traffic superintendent, General Telephone Co. of Illinois, has joined the personnel department at New York as training and recruitment supervisor. Mr. Alms reports to Marshall K. Taylor, personnel director.

M. R. Houston, former industrial relations director, General Telephone Co. of Upstate New York, has joined the personnel department in New York as wage and salary administrator, reporting to Mr. Taylor. Mr. Houston succeeds James L. Malone, who has been promoted to the position of personnel administrator at the New York office.

Maurice Gross, safety supervisor at General Telephone Co. of Calif., will succeed M. R. Houston as industrial relations director at General Telephone Co. of Upstate New York.

Charles A. Crain has been transferred from the industrial relations department of General Telephone Co., of Illinois to the position of industrial relations director for the Midwest properties of General Telephone System, comprising General Telephone Companies of Iowa, Nebraska and Missouri. Mr. Crain's headquarters will be at Grinnell, Ia., and he will report directly to J. L. Van Horn, president of those companies.

Rate Boost Approved For Oneida County Tel.

THE NEW YORK Public Service Commission has accepted a tariff amendment filed by Oneida County Rural Telephone Co., designed to increase rates by an estimated $7,600 annually.

The company serves about 1,200 customers through dial exchanges located at Holland Patent and Westernville, N. Y. The 900 subscribers served by the Holland Patent exchange also have toll-free service to

the 700 telephones served by the Barneveld exchange of New York Telephone Company.

In filing its new tariff, the company said additional revenues were needed to offset major increases in taxes and wages if it were to continue adequate service to its subscribers. In support of this contention, the company reported that its local property assessments had been increased by about 67 percent last year, resulting in a hike of almost $3,000 in operating taxes. In the aggregate, it is estimated that the company's operating expenses for the next 12 months will exceed 1956 costs by about $8,000.

The new tariff provides for monthly increases of 50 cents for five and ten-party residential service, 75 cents for two-party residential service and $1.00 for individual residential service. All business service rates are to be increased by $1.50 monthly.

Michigan General Elects Boveri, Sec.-Treas.

CHARLES E. BOVERI, formerly assistant controller, General Telephone Co. of Michigan, has been elected secretary-treasurer of the company. In addition to this move, the board of directors accepted the resignation of Robert J. White, former secretary-treasurer who has accepted the position of director of Industrial relations with General Telephone Co. of the Southeast.

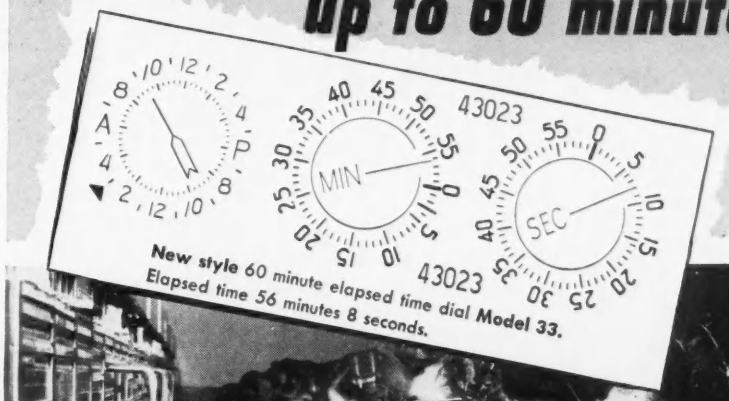
General of Southwest Reports On New Rates

THE FOLLOWING rate increases became effective in exchanges of General Telephone Co. of the Southwest during the month of March, 1957:

Exchange	Effective Date		Old Rates	New Rates
Kyle, Texas	Mar. 3, 1957			
Conversion to dial		Bus.-1-Pty.	$6.75	$10.00
182 Stations		2-Pty.	5.75	7.50
		Res.-1-Pty.	3.25	5.00
		2-Pty.	2.75	4.50
		4-Pty.	.....	4.00
Miami, Texas	Mar. 6. 1957			
Conversion to Dial		Bus.-1-Pty.	5.50	8.50
297 Stations		2-Pty.	4.50	7.00
		Res.-1-Pty.	3.50	4.75
		2-Pty	3.00	4.00
		4-Pty.	2.50	3.50
Happy, Texas	Mar. 1, 1957			
Dial		Bus.-1-Pty.	9.00	10.25
EAS Established		2-Pty.	7.50	8.75
204 Stations		Res.-1-Pty.	4.50	5.00
		2-Pty.	3.75	4.25
		4-Pty.	3.25	3.75
White Deer, Texas	Mar. 6, 1957			
Magneto		Bus.-1-Pty.	4.00	9.50
252 Stations		2-Pty.	3.50	8.00
		Res.-1-Pty.	2.75	5.25
		2-Pty.	2.50	4.25

CALCULAGRAPH

Now Automatically gives you accurate Toll Call Records— up to 60 minutes



New style 60 minute elapsed time dial Model 33. Elapsed time 56 minutes 8 seconds.

Photo courtesy of Union Telephone Co., Owosso, Mich.

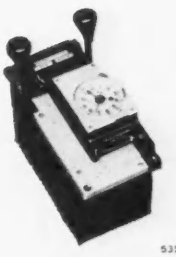
Now, Calculagraph, the modern dependable computer, automatically figures and prints toll calls up to 60 minutes —no need to add 30 minutes on long conversations.

Thus, Calculagraph adds one more feature to reduce human errors by busy operators and increases the volume of calls handled per operator. Assures you of all revenue due on every call.

For accurate toll call records, for automatic computation of elapsed time, for more efficient operation, install the new 60-minute elapsed time Calculagraph on your switchboard.

Information on this new Calculagraph is yours upon request.

Write today for illustrated brochure to Dept. TM



CALCULAGRAPH Company
HARRISON, N. J.

DEPENDABLE ELAPSED TIME COMPUTERS SINCE 1892

A TE&M Service Department

NEW PRODUCTS

TE&M's New Product Editor has selected items of particular interest to you at this time of the year. Complete data on each New Product may be obtained by using the Readers' Service Coupon you'll find on page 65.

Battery Cell Filler

A BATTERY cell filler that was developed especially for railway service is now being made available to industrial plants by Gould-National Batteries, Inc. Called the "Rite-Hite" cell

filler, it controls the electrolyte level in batteries by adding water to the correct height without overflushing.

The Rite-Hite filler is made in five models — three horizontal and two vertical. The 15-in. horizontal and the 9-in. vertical fillers are best adapted to industrial-truck use.

The filler, connected to a water supply of 20- to 50-psi pressure, consists of a long tube to allow reaching across large batteries and a hydrostatic means of controlling flow. With the end of the tube inserted in the cell opening to the proper depth as determined by a stop on the tube, water flow is turned on by a lever that operates a spring valve. As soon as the electrolyte level covers the end of the tube, a partial vacuum within a small copper tube running inside the water tube builds up and causes a diaphragm within the housing to release the spring valve and stop the water flow.

Automatic shut-off of water eliminates the possibility of adding too much water and thus provides uniform electrolyte heights and longer battery life. The cell filler, manually operated by the lever, is also handy for washing off the top of battery cells, preferably before cells are filled and with vent plugs in place.

Maintenance of the Rite-Hite cell filler is simple as it has few moving parts. In cold areas, it should be drained of water when not in use to avoid freezing. As the nozzle on the filler is removable and threaded into a coupling on the tube, the filler can be adapted quickly to filling all types of batteries. — For complete data, *Check New Product* 140.

Contact Burnisher

THE P. K. Neuses, Inc., has announced the availability of non-residual contact burnisher for silver, platinum, gold, palladium, tungsten, molybdenum, and all precious metal contacts.

It is said to leave nothing on the contact to start a new carbonaceous build-up — no filings — no grit — no dust — no film.

It is flexible with just enough stiffness so that the right amount of pressure can be applied to contact face. Both sides of blade have an abrasive surface that is subject to a minimum amount of wear. Plastic handle is an

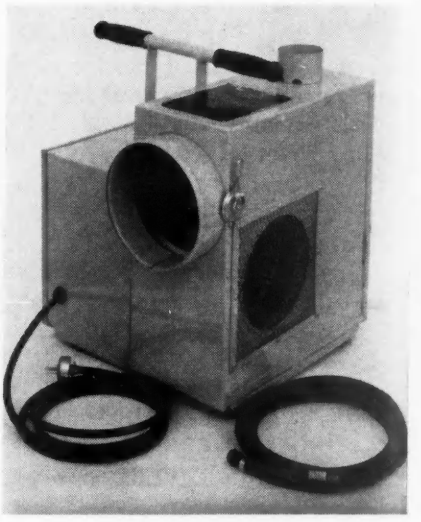
insulator for working on live contacts.

Overall length is 3″ with 2″ abrasive surface. 3/16″ width by .007 thickness. Comes in individual vinyl carrying case. For complete information, *Check New Product* 141.

Ventilating Heater

A NEW ventilating heater designed especially for year-round underground operation is being produced by Morrison-Pelsue Co.

Operating on either AC or DC from portable generator power to 110 power tap, the MoPeCo model



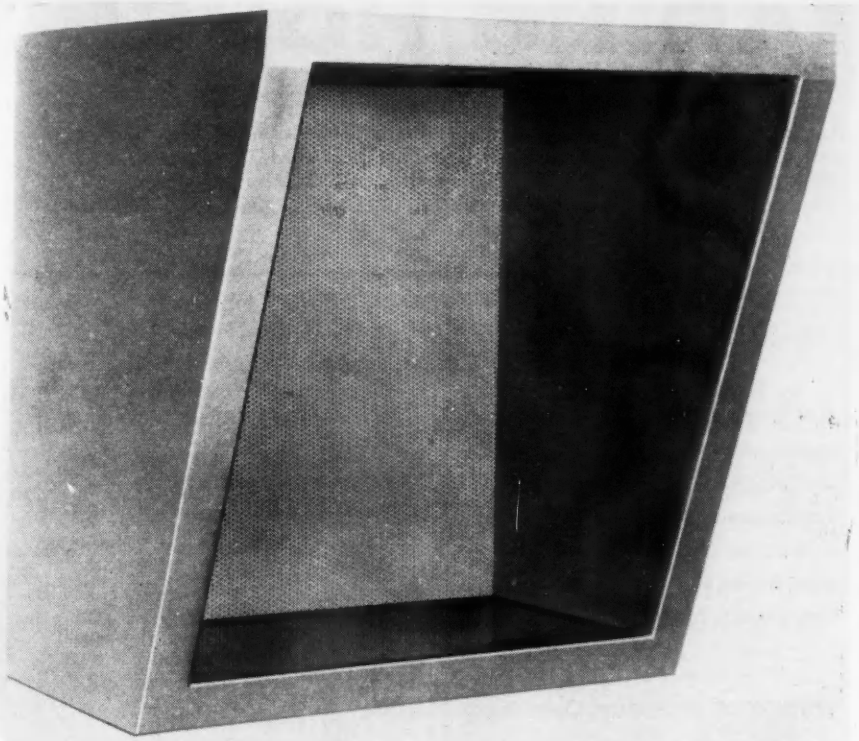
ACM (or DCM) ventilating heater furnishes a constant supply of forced fresh air to manhole workers, preventing accidents caused by explosions or oxygen deficiency, enabling workmen to work with greater speed and safety. Its heater warms old paraffin splices.

MoPeCo models ACM or DCM are portable, weigh 70 pounds and blow from 300 to 800 cfm fresh air for summer operations. In winter, when warm air is desired and the MoPeCo units are ignited by spark ignition. The automatic spark ignites a 45,000 B.T.U. propane burner which can be controlled to give 10° to 90°F temperature rise in the manhole.

MoPeCo ventilating heaters are best suited for telephone, telegraph, electric, water and gas utilities underground operations. They have an additional outlet at tank pressure for lead furnace operation.

A stainless steel combustion chamber and heat exchanger is standard equipment. Only fresh air is blown into manhole, since combustion products from the burner are blown into the air. Fresh air passing over the heat exchanger is heated and forced into the manhole through a lightweight, flexible Spiratube duct.

An automatic gas shut-off valve is



an added safety feature to cut off gas in case of power or burner failure. Repeated tests show absence of CO and CO_2 gasses in the airstream. For detailed brochure, *Check New Product* 142.

New Booth

SUTTLE Equipment Co., has announced new Suttle Model A-12 shop booth for use in noisy locations in factories, feed mills, processing plants, printing plants, bakeries, and many other locations where a difficult hearing problem exists.

The Model A-12 has been scientifically designed to provide maximum sound absorption, a trim, clean appearance, and comfortable writing space for factory use.

According to C. L. Lineburger, sales manager of Suttle's manufacturing division, the company is able to produce the units at a low cost — For complete data, *Check NP* 143.

READER'S SERVICE DEPT.

T - E - M
5 - 1 - 57

■ PLEASE PRINT

NAME: .....

TITLE: .....

COMPANY: .....

ADDRESS: .....

Telephone Engineer Publishing Corp.
7720 N. Sheridan Road
Chicago 26, Ill.

■ Please send me information on the following items: — (Check Items Wanted)

NEW PRODUCTS

NP 140..... NP 141..... NP 142..... NP 143.....

SERVICES AND SUPPLIES

ADV. 1..... ADV. 2..... ADV. 3..... ADV. 4..... ADV. 5.....

ADV. 6..... ADV. 7..... ADV. 8..... ADV. 9..... ADV. 10.....

ADV. 11..... ADV. 12..... ADV. 13.....

BUYERS' GUIDE

ADVERTISING. Directories — *General Telephone Directory Co., 1800 Busse Highway, Des Plaines, Ill.*—[ADV. 1]

BELTS — CLIMBERS — COMPLETE LINEMEN'S EQUIPMENT, *W. M. Bashlin Co., Bashlin Bldg., Grove City 1, Pa.*—[ADV. 2]

BOOTHS—Acoustic Telephones — *Sherron Metallic Corp., 1202 Flushing Ave., Brooklyn 6, N. Y.*—[ADV. 3]

BORING MACHINES, EARTH — *Highway Trailer Co., Edgerton, Wis.*—[ADV. 4]

CORDS, Switchboard (with or without plugs), Instrument (retractable and regular) and Operators — *Commercial Cord & Supply Co., Inc., 26 Main St., Clifton Springs, N. Y.*—[ADV. 5]

CORDS, Switchboard & Telephone — *Runzel Cord & Wire Co., 4727-31 Montrose Ave., Chicago 41, Ill.*—[ADV. 6]

PIPE PUSHERS — *Giant Manufacturing Co., South 6th St., at 12th Ave., Council Bluffs, Iowa.*—[ADV. 7]

POLES, Southern Yellow Pine — *Taylor Colquitt Company, 217 E. Main St., Spartanburgh, S. C.*—[ADV. 8]

POLES, Southern Yellow Pine — *Texas Creosoting Co., Orange, Texas.*—[ADV. 9]

PROTECTIVE EQUIPMENT — *Reliable Electric Company, 3145 Carroll Avenue, Chicago 12, Ill.*—[ADV. 10]—

REBUILT TELEPHONES & SWITCHBOARDS — *Telephone Repair & Supply Company, 1760 Lunt Avenue, Chicago 26, Ill.*—[ADV. 11]

WIRE, Insulated — DATED DROP WIRE — Neoprene or Weatherproof — *Alphaduct Wire & Cable Co., New Brunswick, N. J.*—[ADV. 12]

WIRE, Insulated Drop and Bronze of Copperweld — *Acorn Insulated Wire Co., Inc., 36 Freeman St., Pawtucket, R. I.*—[ADV. 13]

THE CLEARING HOUSE

Published in each issue of Telephone Engineer & Management. Advertising forms close on 1st & 15th of month. Rates 15 cents a word except for Situation Wanted ads, which are only 10 cents per word. In figuring cost of ads, count each word of address in number of words used. All ads payable in advance. Minimum charge—$2.00. Special rates for display ads on request. Send copy and box number replies to Telephone Engineer Publishing Corp., 7720 N. Sheridan Road, Chicago 26, Ill.

HELP WANTED

CABLE SPLICERS, Station Installers, Equipment Installers, Linemen. Experienced men needed. Steady work, good pay. Henkels & McCoy, 1211 Kenmore Avenue, Elkhart, Indiana, or 6100 N. 20th St., Philadelphia, Pa.

PLANT ENGINEERS — For large Independent Telephone Company. Some experience necessary. In reply state age, educational and employment history. Address reply to Personnel Supervisor, Rochester Telephone Corporation, 10 Franklin Street, Rochester 4, New York.

WANTED: Appraisal Engineer capable of supervising crews with knowledge of automatic central office equipment. Permanent. Will be located in Ohio. Reply Box 9065 Telephone Engineer Publishing Corp. 7720 N. Sheridan Road, Chicago 26, Illinois.

HELP WANTED: Outside plant engineer for growing company in Southeastern United States. Will have full responsibility for engineering within operating area. Some experience necessary. Write Box 9067 Telephone Engineer Publishing Corp., 7720 N. Sheridan Road, Chicago 26, Illinois.

SITUATION WANTED

SITUATION WANTED: Resident engineer, 34 years of age, 16 years experience in all phases of telephone work, wish permanent place as manager or plant engineer. Reply Box 9066 Telephone Engineer Publishing Corp., 7720 N. Sheridan Road, Chicago 26, Illinois.

FOR SALE

FOR SALE: Almost new Stromberg-Carlson Switchboard in service less than five years. 2 pos. x 106 junior multiple, machine ringing, equipped with 220 C B Local lines, 60 lamp ended rural lines, 20 lamp ended toll lines, 30 (4) party universal cord circuits 48 volts, complete with line relay rack, power panel, S. C. Multi frequency interrupter, emergency converter, main frame with Cook #100 protectors, Batteries and #150-B-3 amp Flotrol charger.

Augusta Telephone Co.
Augusta, Michigan

FOR SALE: Class E telephone Co. A fine business opportunity for man and wife with limited capital. For information write —

Box 24
Johnstown, Neb.

FOR SALE

400 Line, W. E. Common Battery Switchboard and Complete C. O. Equipment. Equipment is approximately nine years old. It was cut out of service a few months ago.

Can be purchased at Low Reduced Price.

Write W. J. Holladay, Gen. Mgr.,
ALABAMA TELEPHONE CO.,
Fayette, Alabama

FOR SALE

WESTERN ELECTRIC NO. 392 LOUD BELLS
Refinished and tested, with condenser — $6.00 each.
Telephone Equipment, Inc., Montrose, Mich.

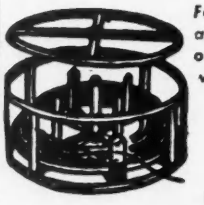
FOR SALE

REBUILT EQUIPMENT

LEICH. #901—1600—2500 Ohm	@ $21.45 Ea.
WESTERN. #302 EW. Desk	@ $14.00 Ea.
MONOPHONES. Type 40, Manual	@ $13.50 Ea.
LEICH. #601-A. Manual	@ $13.00 Ea.
SUBCYCLE. MODEL B. Heavy Duty	@ $30.00 Ea.
SUBCYCLE. MODEL M.7.5. Light	@ $20.00 Ea.

QUOTATIONS. F.O.B. CHICAGO, ILL.

INDEPENDENT TELEPHONE REPAIR CO.
2137 West 21st St. Chicago 8, Ill.



For illustrated literature on this payout, take-up wire reel, write

Whitaker Reel Mfg. Co.
P. O. Box 1318
MONROE, LOUISIANA

STEPPING SWITCHES

45 ea. Western Electric No. 206 Type 4 level 22 Pt. with wipers staggered to give 2 level 44 Pt. operation. 6 ohm coil with 1 break and make interrupter springs. All bridging wipers.

45 ea. Western Electric No. 206 Type 5 level 22 Pt. 4.5 ohm coil with 1 break and make interrupter springs. All bridging wipers.

12 ea. Western Electric No. 206-BS with No. 26-E Banks 4 level 22 Pt. with 3 non-bridging wipers, 1 bridging wiper. 15 ohm coil and 1 break interrupter springs.

45 ea. Western Electric No. 204 Type Minor Switch 1 level 10 Pt.. No off-normal contacts 6.2 ohm stepping coil and 12.9 ohm release coil.

Above in Excellent Condition—As removed from New Equipment

Whatever Your Needs . . . It Pays to Call BUTELCO

BUCKEYE TELEPHONE & SUPPLY CO.

P. O. Box 5707 **HU 8-0655** **Columbus 21, Ohio**

Professional Services

Save Money and Time!
TELEPHONE PRINTING SPECIALISTS FOR 49 YEARS
TOLL TICKETS ILLOUT on Bond Paper ONLY 40¢ THOUSAND (in 20,000)
TELEPHONE 42-3341
CULLOM & GHERTNER CO.
PRINTERS • LITHOGRAPHERS
600 21ST AVE., N. • NASHVILLE, TENN.

HARRIS-McBURNEY CO.
PUBLIC UTILITY CONSTRUCTION
A complete construction service for the telephone industry
Construction Crews — Engineering
Station Installers — Appraisals & Reports
Cable Splicers — C. O. Installation
Underground Duct Systems
Telephone ST 4-6126
P. O. ox 267 — Jackson, Michigan

Shield Yourself Against Chiggers & Ticks!
Ticks-Off repels and kills disease-carrying insects—ticks, chiggers, mosquitoes, black flies, many others. Fights Rocky Mountain Spotted Fever, Tick Fever, Rabbit Fever, etc. Used by U. S. Armed Services; U. S. and State forestry, wildlife, conservation depts.; outdoorsmen coast to coast. Lightly mist clothes and skin for all-day protection.
America's No. 1 Spray-On Insect Repellent
Whitmire's TICKS-OFF INSECT REPELLENT BOMB REPELS
MINE SAFETY APPLIANCES CO.
54 Branches Everywhere
Home Office: Pittsburgh 8, Pa.

EVERT M. OSTLUND
Planning — Engineering — Development
Radio and Microwave — Telephone
Installations, Systems, Equipment
Lake Mohawk 8635 — *Andover, N. J.*

CARL C. CRANE, INC.
Consulting Engineers
2702 Monroe Street, Madison 5, Wis.
Telephone CEDAR 3-4210

TELEPHONE PRINTING
By People Who Know the Telephone Business. See the Suttle Catalog.
SUTTLE EQUIPMENT CO.
LAWRENCEVILLE — ILLINOIS

Davis Construction Co.
UTILITY PLANT CONSTRUCTION
45 North Clark Street • Sullivan Missouri

ACCOUNTING & AUDITING SERVICES
Available to All Class A, B, & C, Telephone Companies Anywhere
Write: Frank M. Clark
Telephone Accounting Services
3969 Ruckle St., Indianapolis 5, Indiana

INSPECTION SERVICE
"AT TIMBER TREATING PLANTS."
Of poles, crossarms, and preservative treatments. Analysis of wood preserving. Consulting and specifications writing.
A. W. WILLIAMS INSPECTION CO., INC.
MOBILE, ALABAMA
Inspectors stationed throughout the U.S.A.

Let A Low Cost PROFESSIONAL AD In Telephone Engineer & Management Do The Job For You

NEALE CONSTRUCTION CO.
ENGINEERING • CONSTRUCTION • MAINTENANCE
TOPEKA, KANSAS — PHONE 4-2621

JAY G. MITCHELL
CONSULTING ENGINEER
APPRAISALS—COSTS—PLANT
2720 SHERIDAN ROAD — CHICAGO
FOR MAIL BOX 523 EVANSTON, ILLINOIS

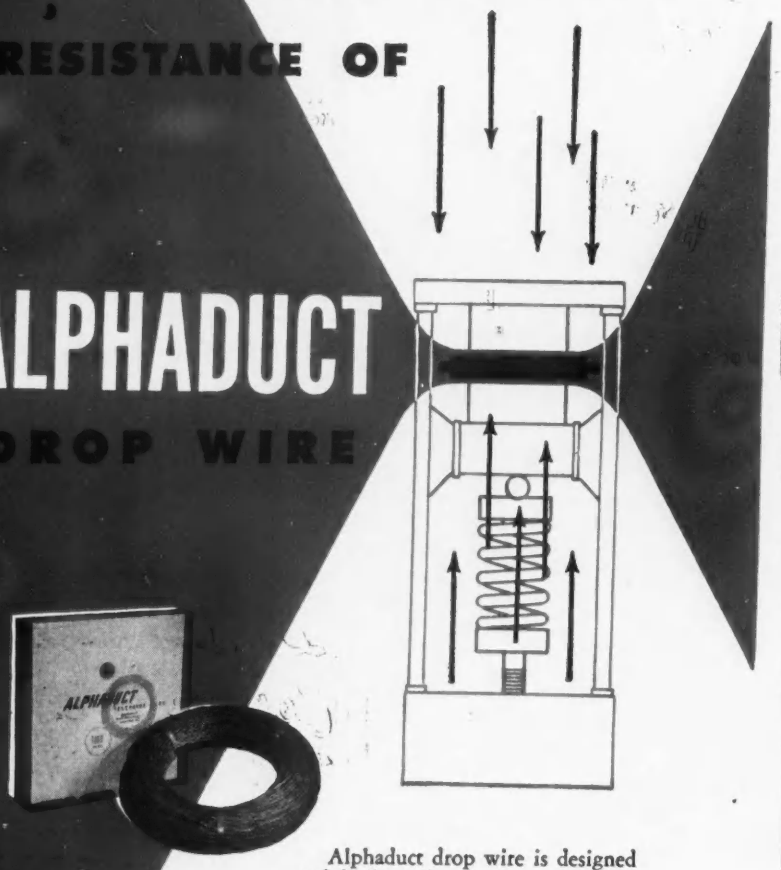
Construction Crews — Station Installers
Central Office Installations
Cable Splicers — Complete Engineering
HENKELS & McCOY
6100 North 20th Street Philadelphia, Pa.
Now Operating in 30 States
OFFICES LOCATED AT
Elkhart, Ind. - Tel. 2-5650
Norwalk, Ohio - Tel. 3-0231
Lansing, Mich. - Tel. IV-5-7642
Pekin, Ill. - Tel. 6-6336
Erie, Pa. - Tel. 2-4390
Sumter, S. C.
PERFORMANCE Has Built Our Business

1500 pounds

MINIMUM COMPRESSION RESISTANCE OF

ALPHADUCT

DROP WIRE



Alphaduct drop wire is designed and built to be the longest lasting drop wire you've ever installed. It's tested . . . completely, thoroughly and often to make sure that every single coil is up to Alphaduct's rigid standards.

Here's how the insulation is tested to make sure it won't crush.

Short lengths of Alphaduct are placed between the steel plates of a compression testing machine. These plates are then forced together at uniform speed until the insulation crushes. Alphaduct parallel drop wire has to withstand a minimum load of 1500 pounds before it breaks. Each conductor of Alphaduct twisted pair will withstand a 1000 pound pressure.

You don't have to worry about a little rough handling breaking down this kind of tested insulation. Try Alphaduct drop wire. It's dated, so you can see for yourself the extra wear it provides.

ALPHADUCT WIRE AND CABLE COMPANY • NEW BRUNSWICK, N.J.
NATIONAL DISTRIBUTORS • AUTOMATIC ELECTRIC SALES CORP., CHICAGO, ILLINOIS • LEICH SALES CORPORATION, CHICAGO, ILLINOIS. REGIONAL DISTRIBUTORS • PANKEY SUPPLY CO., CHARLOTTESVILLE, VA. THE LINDSAY TELEPHONE SUPPLY CO., CLEVELAND, OHIO

Carrier School Announced By Panhandle Electric

JOHN G. BECKLEY, sales manager, Panhandle Electric Sales, Inc., recently announced that Panhandle Electric has inaugurated a training school to be held monthly in its offices at 604 Johnson Street, Amarillo, Texas.

There is no enrollment or tuition fee for the school.

Data on the school is as follows:

(1) Place: — Panhandle Electric Sales, Inc., 604 Johnson St., Amarillo, Texas.

(2) Dates: — The first Tuesday of each month: May 7; June 4th; July 9th (2nd Tuesday); August 6th; September 3rd; October 1st; November 5th; December 3rd — 1957.

(3) Time: — 9:00 A.M. to 5:00 P.M.

(4) Length: — Three days — Tuesday thru Thursday.

(5) Size Of Class: — Limited to twelve students at each session.

(6) Nature Of Instruction: — General considerations in application of systems; description of systems; analysis of components and circuitory; and installation, adjustment and maintenance.

Manufacturer's Agent Opens Connecticut Office

ELLIS O. LINK AND ASSOCIATES recently announced the opening of an office at 170 West State St., Westport, Conn. Mr. Link, formerly associated with Western Electric, Graybar, North Electric and Indiana Steel & Wire companies, represents the General Machine Products Co., John Bean Division of the Food Machinery & Chemical Corp., Detroit Macoid Co. and the Henry Co. as agent for these concerns for national distribution through the Graybar Electric Co.

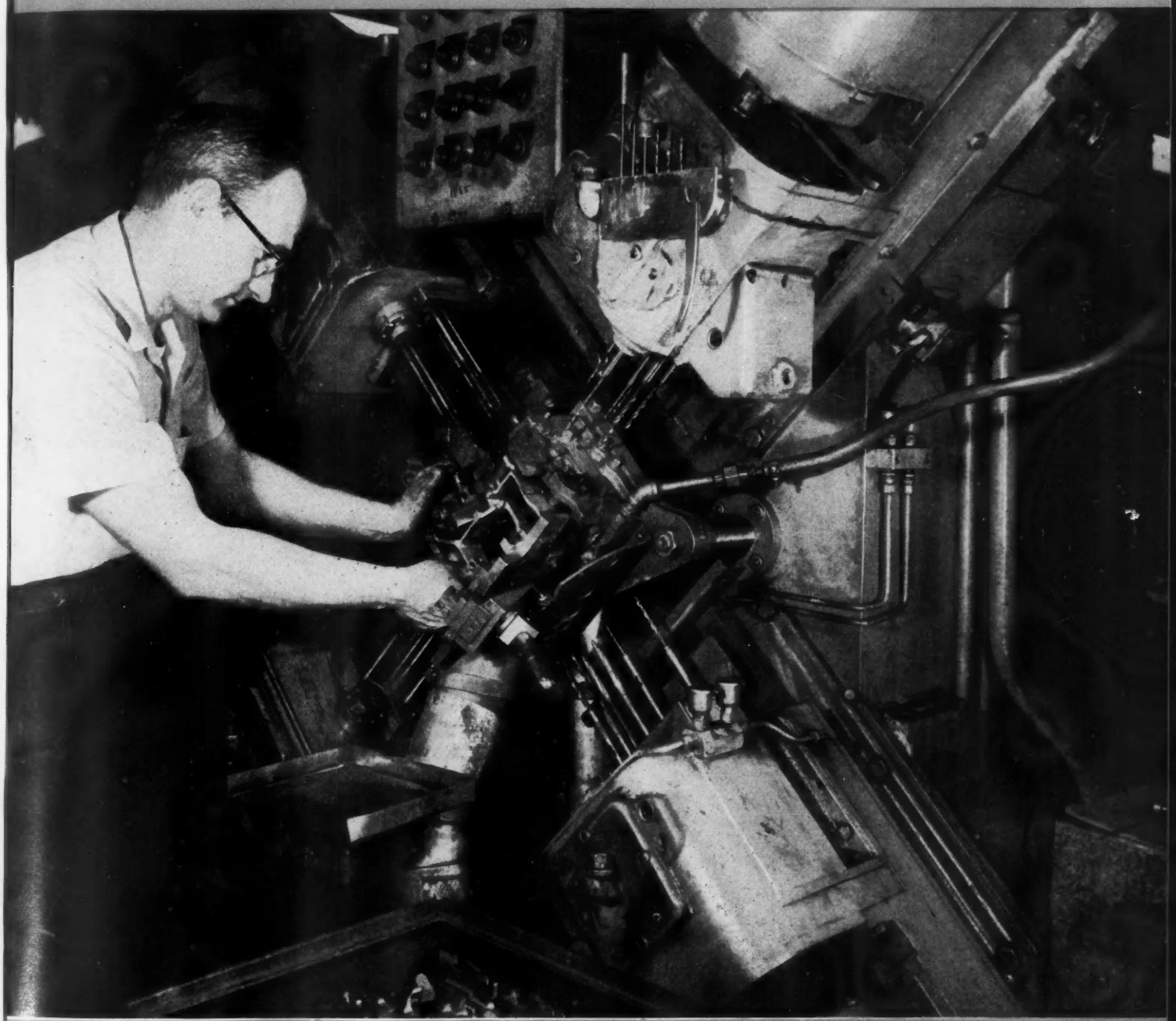
A. E. Sneden Joins National Electric Products

A. E. SNEDEN has been named product manager of the Wire and Cable Division, National Electric Products Corp., Pittsburgh, Pa.

Prior to his new appointment, Mr. Sneden was with Lowell Insulated Wire Co., serving two years as manufacturing representative and three years as vice president and director of sales. He was, for 21 years, associated with The Okonite Co.

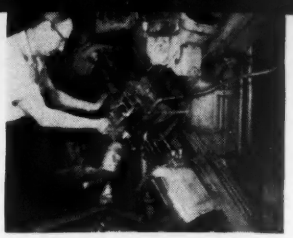
AUTOMATIC ELECTRIC TOPICS

MAY 1957
VOLUME 21
NO. 11



Joe Danilewicz Is Proud of His Work (see next page).

Joe's Proud of His Work



It's Precise, Quality-Productio

The Strowger switch shaft is the mechanical heart of the switch. Circular teeth, being cut on this high-speed screw machine, hold "up" step; lengthwise teeth hold rotary step of switch. Accuracy is held to thousandths of an inch—even to .0005" on one operation.

The switch shaft undergoes exact machining operations. In the final detail of machining, every shaft is gauged for straightness. Total indicator reading cannot exceed .004", or shaft is rejected by inspector. And there's not a rough edge on the finished shaft.

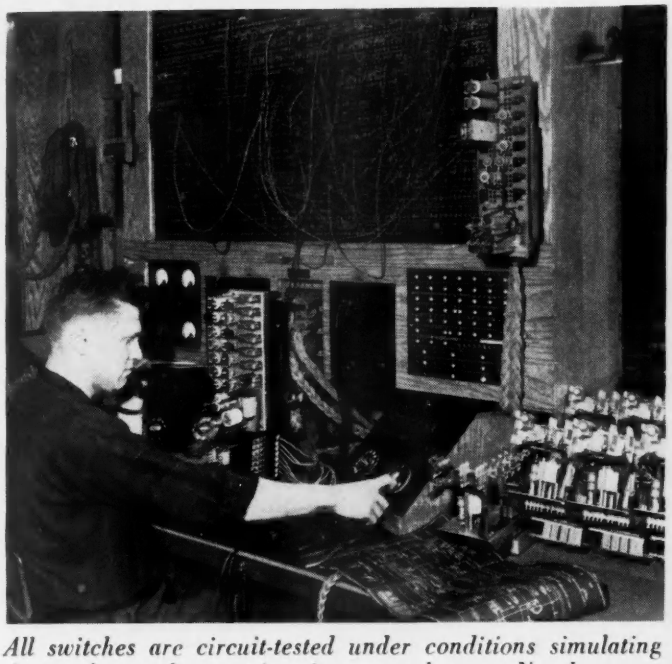
oWork

JOE Danilewicz has worked at Automatic Electric for almost 15 years. Joe, like the many others in Automatic's production and assembly departments, is proud of his work. He's proud of the equipment backing him up, the machines helping him and others make quality the most important part of the Strowger switch.

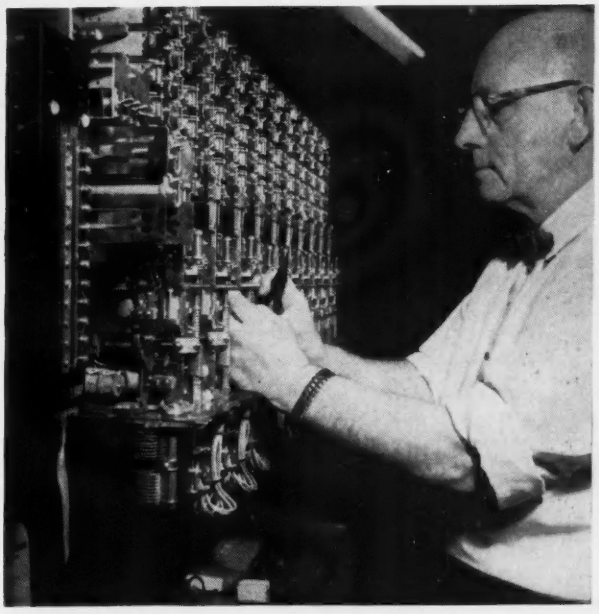
Joe happens to work on a drilling machine, drilling 41 holes in the switch frame which is the backbone of the switch. It takes skill and precision machinery to keep tolerances as close as .002″ on this part. (Other parts call for accuracy to .0005″!). This special care to approach perfection assures the smooth, swift action necessary in telephone switching equipment.

Every component of the Strowger switch receives the same close care, the same checks for accuracy. From the first machining operation, through assembly, to final circuit and mechanical tests, the Strowger switch is manufactured under rigid controls. Just watch one go through its paces, and you'll see that all this attention really pays off for the users of Strowger Automatic.

Here, a switch adjuster is adjusting the "dogs"—the detents that hold the shaft in position until release. The double dog prevents the shaft from dropping to normal while dialing is in process, and the stationary dog holds the rotary position against the return spring.



All switches are circuit-tested under conditions simulating those of actual operation in an exchange. Numbers are dialed and rung; keys are operated, running circuit through switch—all to make sure switch will perform accurately and dependably in an actual exchange. (There are even some tests made to check things which would not ordinarily be found in exchange operation.) Maze of wires ties in connectors, ringers, telephones, selectors, etc., for tests.



After final electrical and component checks are made, final mechanical test assures proper functioning of parts. When this switch is jacked into a switchboard shelf, you may be sure it has been made—and tested—to work perfectly . . . that it is built to last.

Thanks to SATT
Gilroy, California, Become F

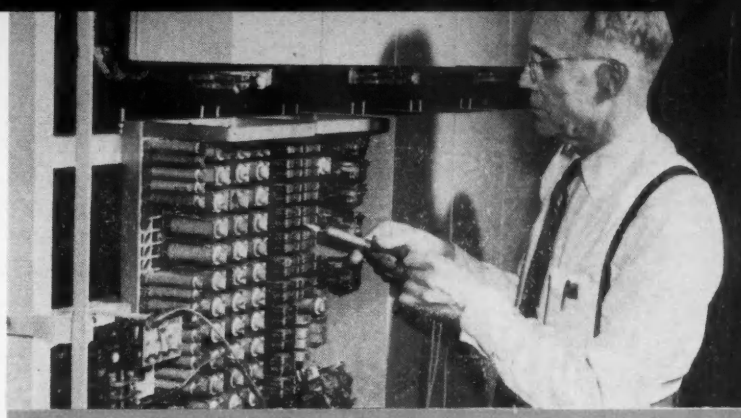
President of Gilroy Telephone Company is Dr. Elmer J. Chesbro, a son of the company's first president, and a former mayor of Gilroy. Dr. Chesbro is also chairman of the South Santa Clara Valley Water District and of the Gilroy city planning commission. Although officially retired from the practice of medicine, he is still active in medical circles. An "after-hours outdoor chef," he is known also for his summertime specialty of barbecued chicken.

(Inset above) Don H. Strahl (right), Manager of Gilroy Telephone Company since 1950, discusses future plans of the company with Automatic's K. A. Regel, Harry Strosnider and John Griesmaier. The Gilroy company has ordered additional Strowger equipment for expansion of its exchange.

WHEN the Gilroy (California) Telephone Company cut over to dial in July, 1955, it was already looking still further into the future—even past its well-founded expectations for the new Strowger Automatic equipment. In fact, while the dial exchange was still in the manufacturing stage, the Gilroy company was making plans for Direct Distance Dialing. So, little more than a year after the cutover to dial, it became the first Independent telephone company west of the Mississippi to provide *nationwide* DDD, serving its 2,715 subscribers with a new installation of Type D Strowger Automatic Toll Ticketing. With this SATT installation completed in August, 1956, Gilroy became a full toll center.

In Type D SATT a checking operator obtains the *calling* number and keys it into the ticketer after the subscriber has dialed the number he wishes to call. The call is then completed automatically.

Full Toll Center



Inspecting Type D SATT ticketer is switchman Ernie Hyser. Gilroy became the first Independent telephone company west of the Mississippi to provide nationwide Direct Distance Dialing — and became a full toll center—with its cutover to SATT in August, 1956.

John Britzius, Gilroy switchman, tests line from SATT supervisory panel to trace cause of trouble call. Traffic counts are also made here to determine busy hour. At right are interrupters and timing equipment.

SATT punched tape is record of information relating to toll calls. Data is transferred to individual tickets by ticket printer, supervised by Mrs. Sherdeen Pillman.

Especially significant is the fact that the Gilroy Company's existing accounting equipment continued to handle the accounting, after the cut to SATT. The usual accounting procedures for a company its size blend smoothly with SATT operation. Tickets from the SATT machine are sorted and rated manually, along with the tickets prepared by the operator. Microfilm records of the tickets are kept by the telephone company, and the original tabs are sent to the customer with his monthly statement.

Don H. Strahl, Manager of the Gilroy Telephone Company since 1950, says: "Our subscribers are very pleased with the Direct Distance Dialing service provided by the SATT system. Furnishing the subscriber with the machine tickets as well as the manual tickets eliminates almost all questions regarding toll billings. During our peak period since the installation of the SATT system, the machine handled approximately half of our total of 1300 tickets per day. Without the SATT system, we could never have taken on the toll center function."

Gilroy's conversion to dial actually had its beginning in 1950, when the company began to rebuild its plant—a plant which now includes 1600 lines (3000 terminals) of Type 20 Strowger equipment, and a four-position Type 31 Toll board, in addition to the SATT equipment.

The Gilroy Telephone Company's growth parallels that of the community itself. For many years Gilroy was the southern terminus of the Southern Pacific Railroad and the shipping point for cattle raised in the fertile Santa Clara Valley. Later, dry farming was introduced in the area, and with the coming of irrigation more intensive farming followed.

The community is still growing, and the telephone company constantly takes steps to keep pace. Already, on order are an additional 400 lines (600 terminals) of Strowger Automatic equipment, and two positions of toll board, for Gilroy's expansion.

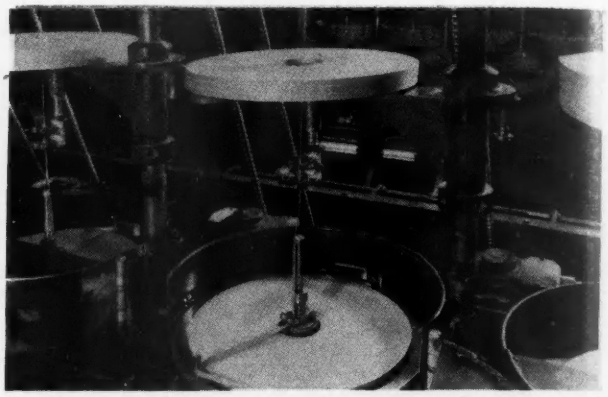
General Cable Corporation--

Pioneer in Life Lines of Communication

General Cable Corporation experts discussing a telephone cable problem include the vice president in charge of research, and specialists from the Laboratory, Engineering and Manufacturing.

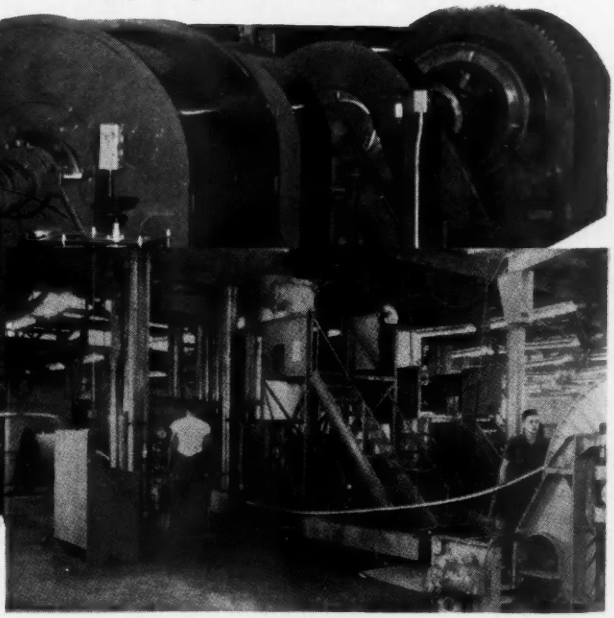
Just a few short years after the telephone first came into practical use, General Cable Corporation began developing and supplying wire and cable for inside and outside plant installations. Today—75 years later—General Cable is the largest independent manufacturer and most versatile supplier of communication wires and cables to the telephone industry, as well as to the armed forces.

Nine of General Cable's manufacturing plants are strategically located to serve telephone companies. There is a laboratory at each location, in addition to a research and development center at Bayonne, N. J. This constant research, coupled with long experience, assures high standards of perfection in General Cable's products, which are available to you through Automatic Electric.



In the manufacture of unit-constructed, paper-lead telephone cable, individual wires, after having been drawn down to proper size, are insulated with paper tape—color-coded for easy circuit identification during installation. This "head" of a paper-taping machine travels at a speed of about 3000 rpm. Uninsulated wire, on reels under the machine, comes out paper-insulated and passes through the center of the upper roll of paper tape, which is ready for later use.

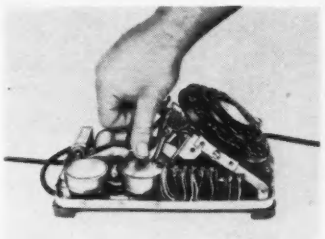
In the next operation — "pairing" — two wires, each paper-insulated, are twisted together. To minimize cross-talk the length of the twist is varied between pairs. Then, on this machine, twisted pairs are stranded together into units for subsequent assembly in the completed cable. As many as 101 pairs are stranded into units on these machines and bound together with a string binder.



Next, a massive machine "cables"—or assembles—units at the same time as it applies two paper tapes (sometimes called "belts") to complete the cable core. After cores are then completely dried with heat and vacuum in dome-like tanks, the final manufacturing operation is the extrusion of an antimony lead sheath over the cable core, by this powerful hydraulically operated press. Before being shipped, telephone cables must pass rigid tests and inspection.

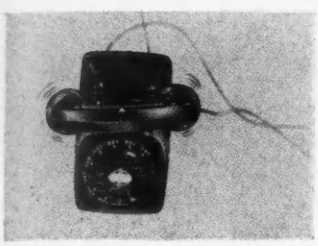
LOOK What AE Did to the Telephone

When Telephones caused problems for telephone men and telephone users, Automatic Electric *did something about it.*



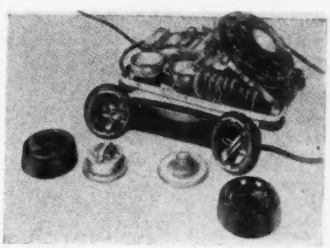
Problem: Installer needed three hands — one to hold down the hook, two to work on telephone!

What AE Did: Equipped telephones with "Installer's Hooklock" to give service man that "extra hand." Hooklock keeps hook down during installation, leaves man with both hands free, restores itself when housing is replaced.



Problem: "Off-hook" trouble made costly service calls necessary.

What AE Did: Developed "Walking Handset." Almost *any* way it's put, right into the cradle it goes. Makes "off-hook" trouble calls almost a thing of the past.

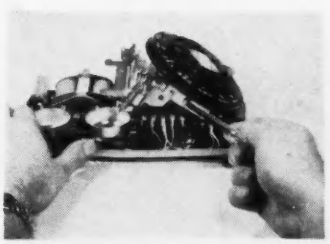


Problem: Difficulty in hearing, unclear transmission.

What AE Did: Developed new short handset, new transmitter and receiver capsules, other advances for lifelike transmission, extraordinary clarity.

Problem: Dial hard to read in poor light.

What AE Did: Slanted dial and put numbers around edge of fingerplate, with arrowheads to guide the eye for easier reading, surer dialing.



Problem: High cost of time-consuming maintenance.

What AE Did: Grouped components together on base—in convenient, screw-mounted units. Made connections with spade terminals—no soldering. All maintenance man needs is a screwdriver.

Problem: Black telephones obtrusive in some color schemes.

What AE Did: Made the telephone a thing of beauty by introducing instruments in color—eight of them—one sure to blend with any interior.

Best of all, Automatic Electric telephones are built to be dependable. They'll ring and talk up, and do it for years with mighty little attention. When you choose these telephones, you've chosen well!

MEMO

Dear Harry,

Ever buy a pink refrigerator? Well, I did--and the first lady of our house is tickled just as pink as the new "icebox". It really does make the kitchen more cozy. While shopping, we saw other appliances in color, too--even bathroom fixtures in shades of pink and blue and yellow. I suppose color is one of the most successful selling features of these modern times. (Have you seen the new beige typewriter we bought for the office?)

I came upon another interesting discovery along these lines--and "closer to home"--when you asked me why we have ordered no black telephones for the past three months. It seems that color sets have become so popular with subscribers that almost every new application for service specifies a telephone in one of the eight harmonizing colors--and requests for extensions are practically 100% for color.

Then I checked our stock of black telephones, and I found it to be sufficient. Some black telephones are returned to stock when a new customer asks for a color set (and extensions) where a black instrument had been installed for a previous subscriber. New orders for black telephones have been taken care of with these. A look at our figures for color sets will show you how good they have been for business.

Incidentally, a big help to us has been the sales aids on color telephones offered by the manufacturer. They supply bill inserts and circulars, Monophone Visualizers (at 25¢ each), and, for displays, miniature telephones in color ($10.00 for a set of eight--and well worth it!).

John

Did you know that Prophetones now come in color, too?

Published by

AUTOMATIC ELECTRIC

A MEMBER OF THE GENERAL TELEPHONE SYSTEM

ONE OF AMERICA'S GREAT COMMUNICATIONS SYSTEMS

Chicago, U.S.A.

John Sharkey, *Editor*

INDEX TO ADVERTISING

Acme Visivle Records, Inc.
Acorn Insulated Wire Co. 64
Alaphaduct Wire & Cable Co. 64, 68
Aluminum Co. of America
American Chain & Cable Corp. 24
(Wright Hoist Div.)
American Creosoting Co.
American Tel. & Tel. Co. 46,-47
Anaconda Wire & Cable Co. 19
Ansonia Wire & Cable Co.
Arrow Fastener Co.
Automatic Electric Sales Corp. 6, 11, 14, 20-21, 69-76
Bakelite Co. 3
Bartlett Mfg. Co.
Barber-Greene Co.
Bashlin, Co., W. M. 64
Benner-Nawman, Inc. 77
Berry & Co., L. M.
Bishop Mfg. Co.
Bohnsack Equip. Co.
Buckeye Telephone & Supply Co. 32
C & D Batteries, Inc.
Cable Spinning Equipment Co. 10
Calculagraph Co., Inc. 63
Chance Co., A. B.
Chase Brass & Copper Co. 18
Collins Radio
Commercial Cord & Supply Co.
Communi-Catering
Cook Electric Co. 4-5
Copperweld Steel Co.
Crane, Carl C. 67
Cullom & Ghertner Co. 67
Davis Construction Co. 67
Detroit-Macoid Corp.
Dillon Co., Inc., W. C. 24
Donnelley & Sons, R. R.
Exide Industrial Div'n. The Electric Storage Battery Co.
Felt & Tarrant Mfg. Co.
Fisher Research Laboratory. Inc.
Gai Phones
Geeco, Inc.
General Cable Corp.
General Insulated Wire Co., Inc.
General Machine Products Corp. 62
General Telephone Directory Co. 2, 64
Giant Mfg. Co. 64
Gladwin Plastics, Inc.
Gould National Batteries, Inc.
Graybar Electric Co.
Greenlee Tool Co.
Hammond Drierite Co.
Harris-McBurney Co. 67
Henkels & McCoy 66, 67
Highway Trailer Co. 64
Holan Corp., J. H.
Holtzer-Cabot Telephone Equipment Div. of National Pneumatic, Inc.
Hubbard & Co.
Independent Tel. Repair Co.
Indiana Steel & Wire Co. 62
International Harvester Co. 12-13
Instrument Laboratories
Justrite Mfg. Corp. 62
Kotolight Corp.
Kearney, James R., Corp.
Kellogg Switchboard & Supply Co. 52-53, 60-61
Kennecott Wire & Cable Corp. 18
Keystone Steel & Wire Co.
Klein & Sons, Mathias 50
Kolled Kords, Inc. 3
Leich Sales Corp. 34-35
Linde Air Products Co.
Lindsay Telephone Supply
Lorain Products Corp.
Mahood, Edwin T.
Markwell Mfg. Co.
McCabe Powers Auto Body Co.
McNulty, Dan
Midwest Electronics
Mine Safety Appliances Co. 67
Minnesota Mining & Manufacturing Co.
Mitchell, Jay G. 67
Morrison-Pelsue Co.
Murphy Engineering Laboratories, Inc.
Natco Corp.
National Standard Corp. 17
National Tel. Supply Co. 80
Neuses Inc., P. K. 77
Newman Mfg. Co.
North Electric Co. 26-27
Northwest Radio & Telexision School
Ostlund, Evert M. 67
Overton Co.
Owens Illinois Glass Co.
Page & Hill, Inc.
Phelps Dodge Copper Products Corp.
Plastic Wire & Cable
Porcelain Products, Inc.
Prairie Implement Co.
Preformed Line Products Co. 79
Power Tools Corp.
Raytheon Manufacturing Co.
Reliable Electric Co. 25
Remington Rand, Inc.
Republic Creosoting Co.
Rex Corp. 15
Reynolds Metals Co.
Rider Publisher, Inc., John F. 8
Runzel Cord & Wire Co.
Schauer Manufacturing Corp.
Seymour Smith & Son, Inc.
Sherron Metallic Corp. 64
Sloan, Cook & Lowe
Stahl Metal Products
Stewart Bros.
Stromberg-Carlson Co. 23, 40-41, 56-57, 58, 67
Sturgis Posture Chair
Superior Cable Corp.
Suttle Equipment Co. 67
Taylor-Colquitt Co.
Tel-E-Lect Products, Inc.
Teletype, Inc.
Telephone Accounting Services 67
Telephone Engineer Publishing Corp.
Telephone Equipment, Inc.
Telephone & Power Supply Co.
Telephone Repair & Supply Co. 64
Telephone Supply Corp.
Telkor, Inc.
Texas Creosoting Co. 64
Tudor & Yager
Universal Controls, Inc. 32
U. S. Independent Tel. Assoc. 30
U. S. Instruments
U. S. Steel Co. (Chem. Div.)
U. S. Steel (American Steel & Wire)
Utility Tool & Body 77
Western Electric Co.
Whitaker Reel Mfg. Co.
Whitney Blake Co. 28-29
Williams, Geo. E., Co. 67
William Inspection Co., A. W.
Wyoming Valley Equip. Co.
York Hoover Corp.

BEST... FOR PUBLIC BUILDINGS

the BN Booth

attracts the eye day or night, promotes more revenue. Colorful, clean, sturdy—the BN Booth is best for you, too!

Consult your distributor or write direct for folder... Benner-Nawman, Inc., 3421 Hollis Street, Oakland 8, California.

a B-N booth is a busy booth!

YOU NEED THIS DIAL BANK CLEANING BRUSH

Just the thing for brushing dust and other accumulations from the terminal levels of selector and connector banks in step-by-step dial systems.

No. N-389A

2⅜" by 6" overall, dielectric fibre handle, best grade nylon bristles.

ONLY $1.89

Prompt Shipment

P. K. NEUSES, INC.

1205 W. Euclid Ave., Arlington Heights, Ill.

Whether a Winch Line Hook or a complete Line Body check your requirements with

UTILITY TOOL & BODY CO.

CLINTONVILLE, WISCONSIN

THE BACK OF THE BOOK

By JOHN G. REYNOLDS

Supply and Demand

LOVE AND marriage tangled over a telephone in Ashton-Upper-Lyne, England, recently, with strange consequences.

An expectant father was waiting nervously outside a telephone booth to call the hospital where his wife was about to give birth. Inside the booth a young suitor was pleading with his girl friend to patch up a quarrel.

Finally the father-to-be could stand the suspense no longer, pulled open the door, dragged the youth out, slugged him, and called the hospital.

His wife, he learned, and the child were doing fine. He was doing fine also: $5 worth, for breaking the young fellow's nose.

Home Is Where the Phone Is

LATEST story of a husband vs. wife disagreement concerns itself with a Copenhagen housewife who complained that her husband took the telephone to work with him every day to stop her running up large telephone bills. We understand the telephone company replied "it would take no action since the telephone was undamaged." We haven't heard the lady's reply.

Corn Research

BELL LABS doesn't make the only contributions to research. It seems a Missouri farmer noticed the corn grew greenest in his fields across the path of an underground telephone cable, where subsoil had been brought to the surface.

He experimented with plowing up the subsoil on a 15-acre plot and found his profits jumped $512.50 and his yield per acre 27 per cent. County farm groups will experiment further.

First-Rate Service

BY WAY of Southwestern Bell we learn that Mrs. Dale Hearne called Mrs. Betty Carroll, Houston, Texas, service representative, recently and asked that a telephone be installed at her neighbors' home and billed to her. When Mrs. Carroll learned that the neighbors' 12-year-old daughter is a cancer victim, she and another service rep., Mrs. LeVaughn Wilkins, got busy and collected $214 for the family. To round off the story, the installer, Russell Langley, arranged to have the installation charges billed to himself.

Diplomacy

OUR Texas correspondent tells us this story should be passed along to all impatient "party-line jigglers" — and we agree with him.

It seems the whole thing started when the conversation of two sisters at Pasadena, Tex., was punctuated by somebody on their party lines jiggling the receiver, obviously encouraging them to hang up.

"Do you suppose someone on your line is rude enough to do that?" one sister asked.

"Heavens, no!" exclaimed the other. "That must be on your line. All my neighbors are very civilized people."

That' we understand, was two months ago. Neither has heard a jiggle since.

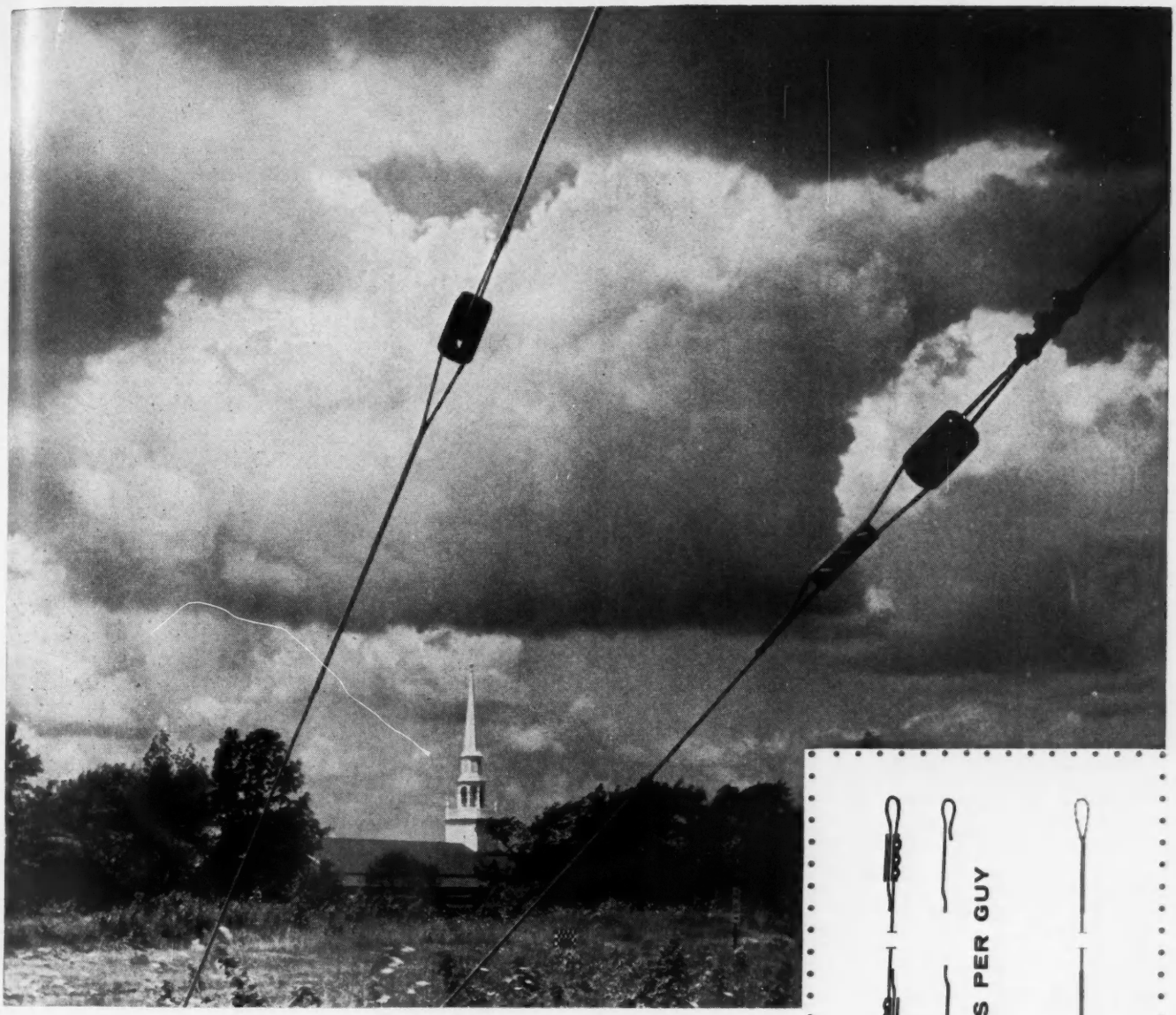
Town "Lends" Phone Dimes

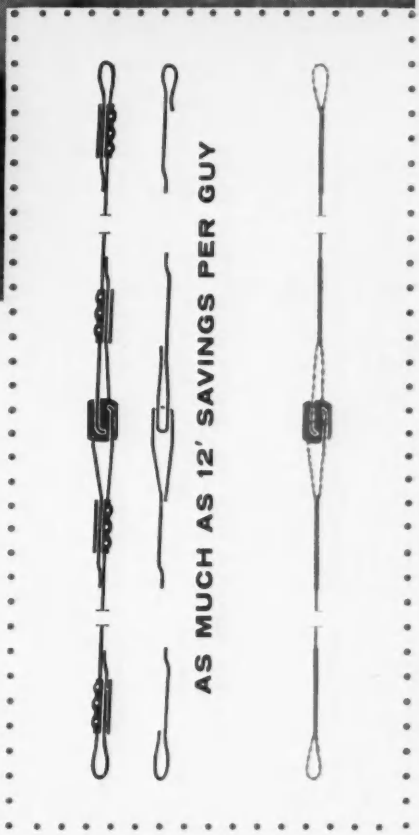
POLICEMEN and firemen in Livingston, N. J., are betting 10 dimes people are honest, and they've put up the money to help persons caught short of change for emergency phone calls.

Envelopes containing dimes are being placed in each of 10 street public pay telephones for use to call a doctor, police or the fire department. A note on the envelope reads: "*Inside this envelope there is a dime for emergency call only. Please send replacement to Livingston police headquarters.*"

We understand "Operation Dime" will last as long as the dimes do.

"YOU'VE GOT TO REDUCE!"





PX-80

Up to 30% savings in strand... with PLP Guy-Grip Dead-Ends

You will find real guying economy with PLP Guy-Grip dead-ends. Because they eliminate strand looping, you can use *shorter, straight* lengths of guy strand. This means as much as 12 feet savings in strand per guy. What's more, the finished installation is neat, streamlined, efficient.

Made in accordance with or for use under U. S. Patent No. 2,761,273; other patents issued and pending.

PREFORMED LINE PRODUCTS CO.

5349 ST. CLAIR AVENUE • CLEVELAND 3, OHIO
DEPT. NO. TR1A
Telephone: Cleveland EXpress 1-3571

THE *Nicopress* SLEEVE AND THE NICOPRESS TOOL GIVE YOU A PERFECT SPLICE

• All you do is clean ends of wire—insert wire in Nicopress sleeve and compress with the Nicopress Tool—It only takes a minute and the completed splice has high conductivity and strength, *permanently.*

Ask your Jobber

Nicopress
is the Registered Trade Mark of The National Telephone Supply Company

The National Telephone Supply Company

5100 SUPERIOR AVENUE • CLEVELAND 3, OHIO

Canadian Mfr.—N. SLATER CO., LTD., HAMILTON, ONT., CANADA

Export Distributor—INTERNATIONAL STANDARD ELECTRIC CORP., NEW YORK, N. Y.

THE NATIONAL TELEPHONE SUPPLY COMPANY